



# Armed Forces College of Medicine

## AFCM



***Veins of Lower Limb***  
***Dr. Gamal T. Abdelhady***  
***Lecturer of Anatomy***

# ***INTENDED LEARNING OBJECTIVES (ILO)***



**By the end of this lecture the student will be  
able to:**

1. Describe beginning, termination, course and tributaries of superficial and deep veins of lower limb.
2. Predict clinical significance of veins of lower limb

# **Lecture Plan**



1. Part 1 (5 min) Introduction
2. Part 2 (35 min) Main lecture
3. Part 3 (5 min) Summary
4. Lecture Quiz (5 min)

# ***Key Points***



***1. Superficial veins of lower limb and their clinical significance***

***2. Deep veins of lower limb and their clinical significance***

# *Veins of the Lower Limb*



## ***Two Divisions***

### **1. Superficial limb veins**

### **2. Deep limb veins**

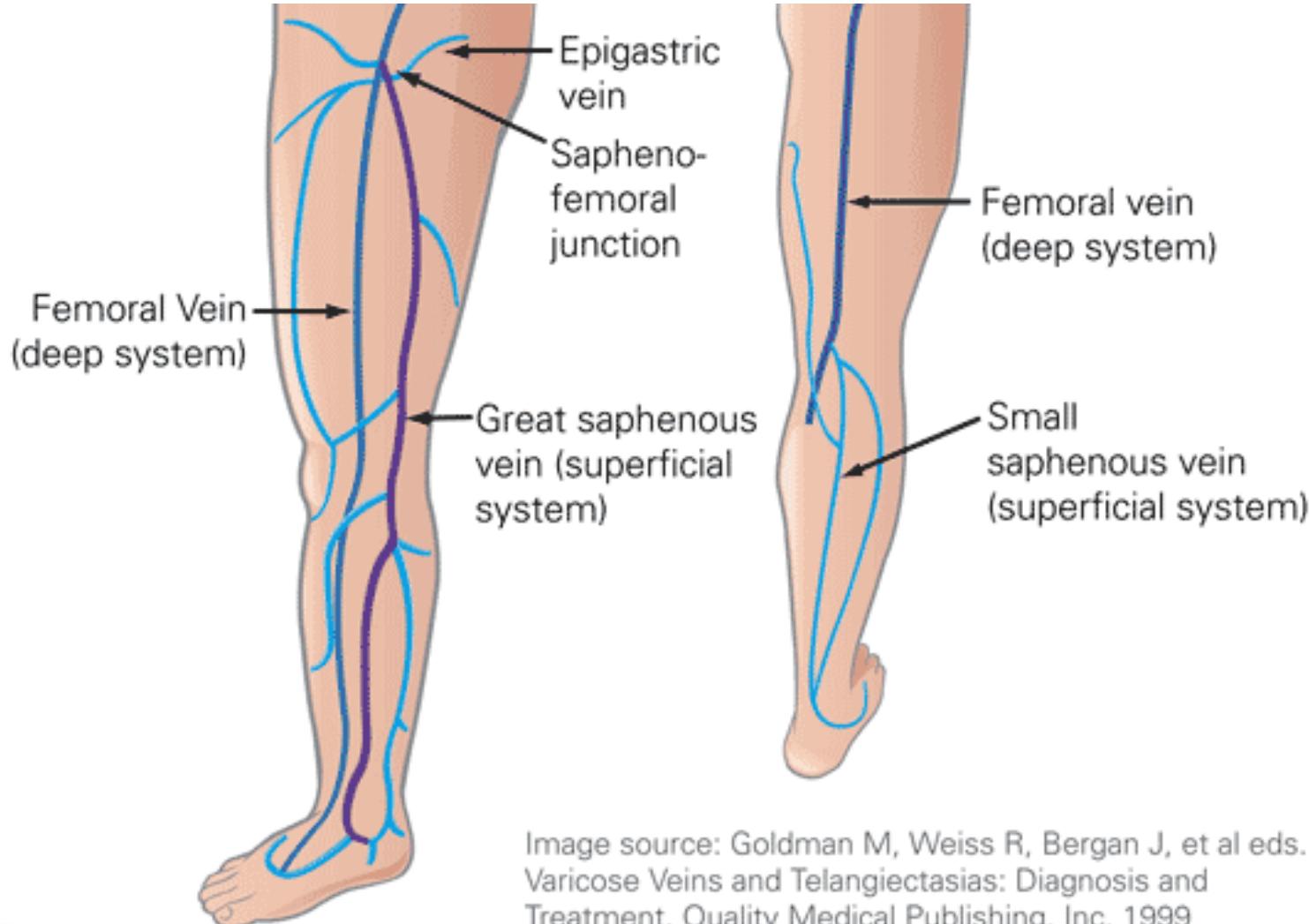


Image source: Goldman M, Weiss R, Bergan J, et al eds. Varicose Veins and Telangiectasias: Diagnosis and Treatment. Quality Medical Publishing, Inc. 1999

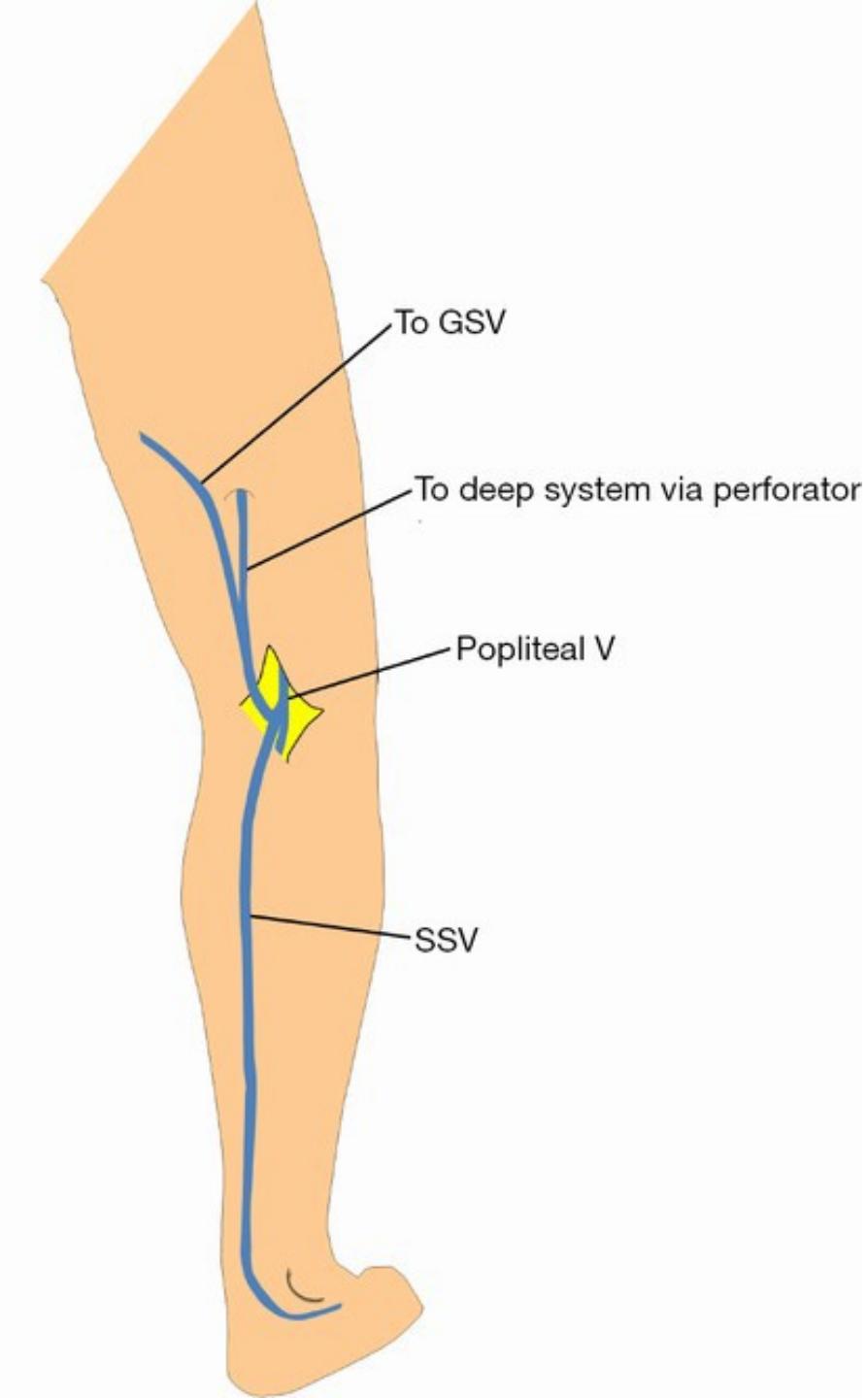
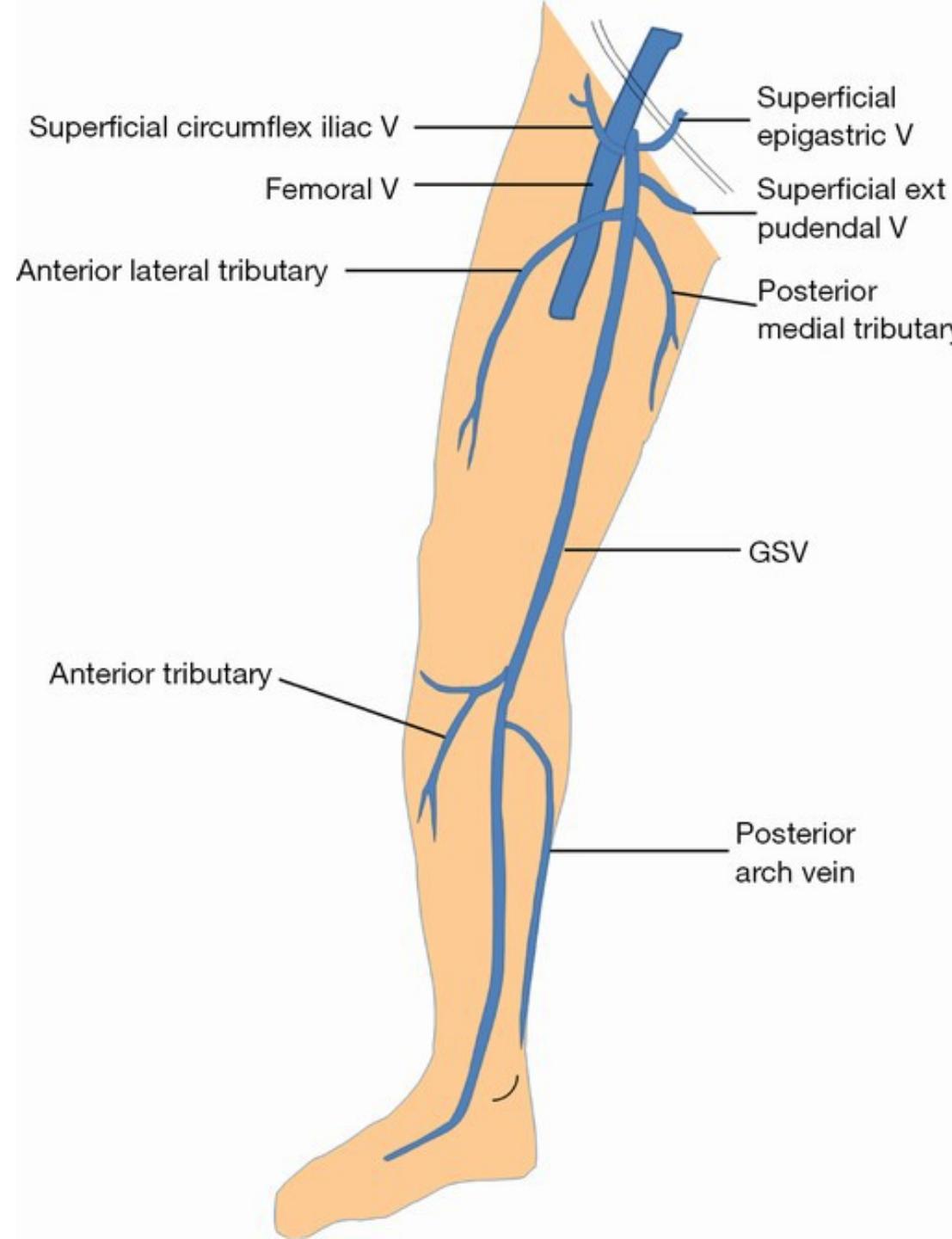
# ***Superficial Veins of the LL***



- Form a network in the subcutaneous tissue
- Pattern is variable

***They are the tributaries of the:***

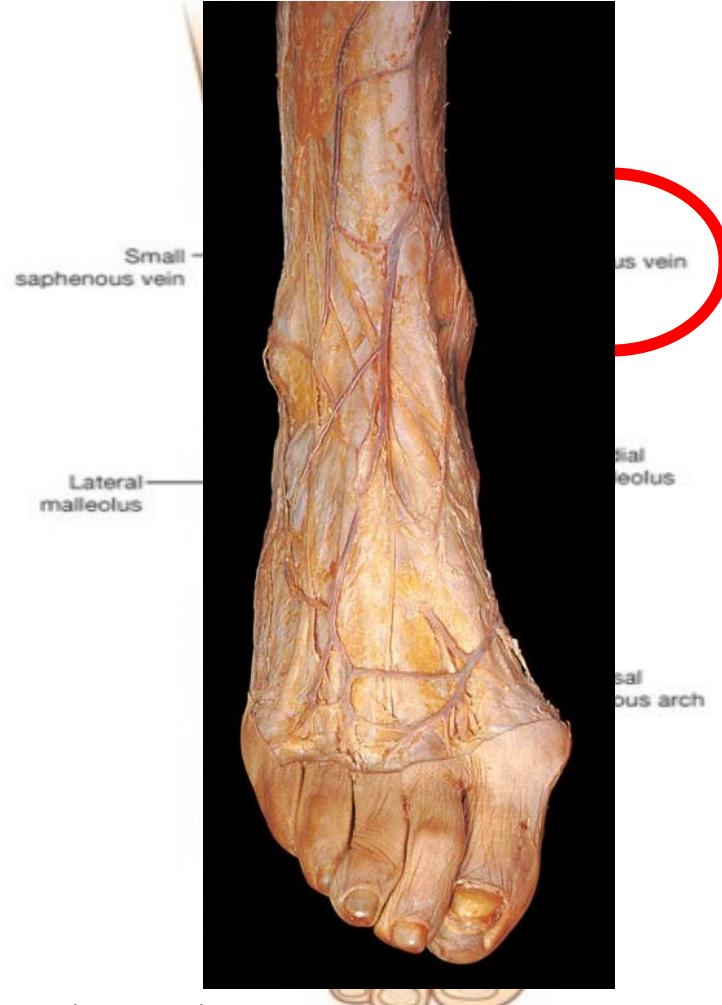
- 1. Great (long) saphenous vein*
- 2. Small (short) saphenous vein*



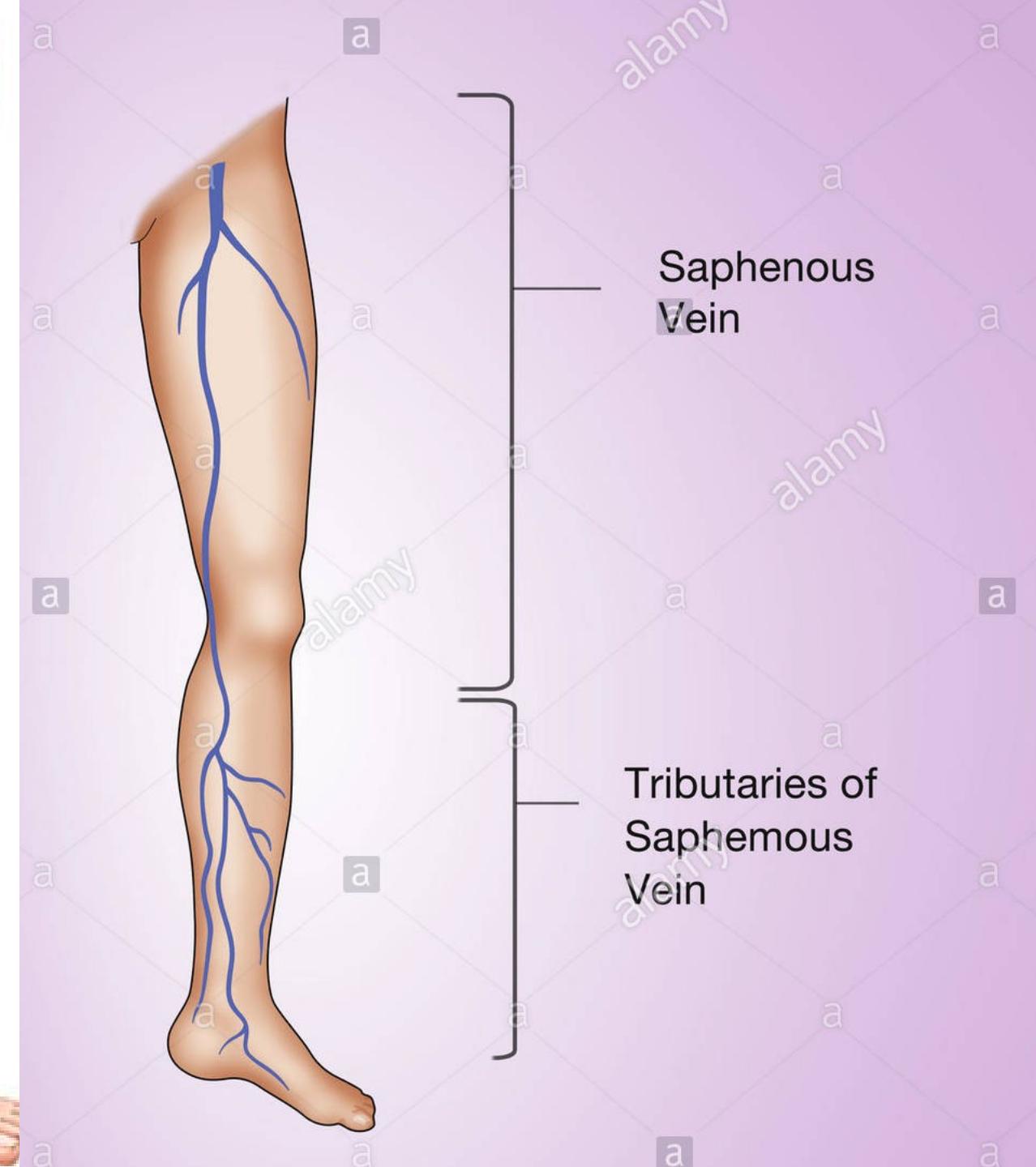
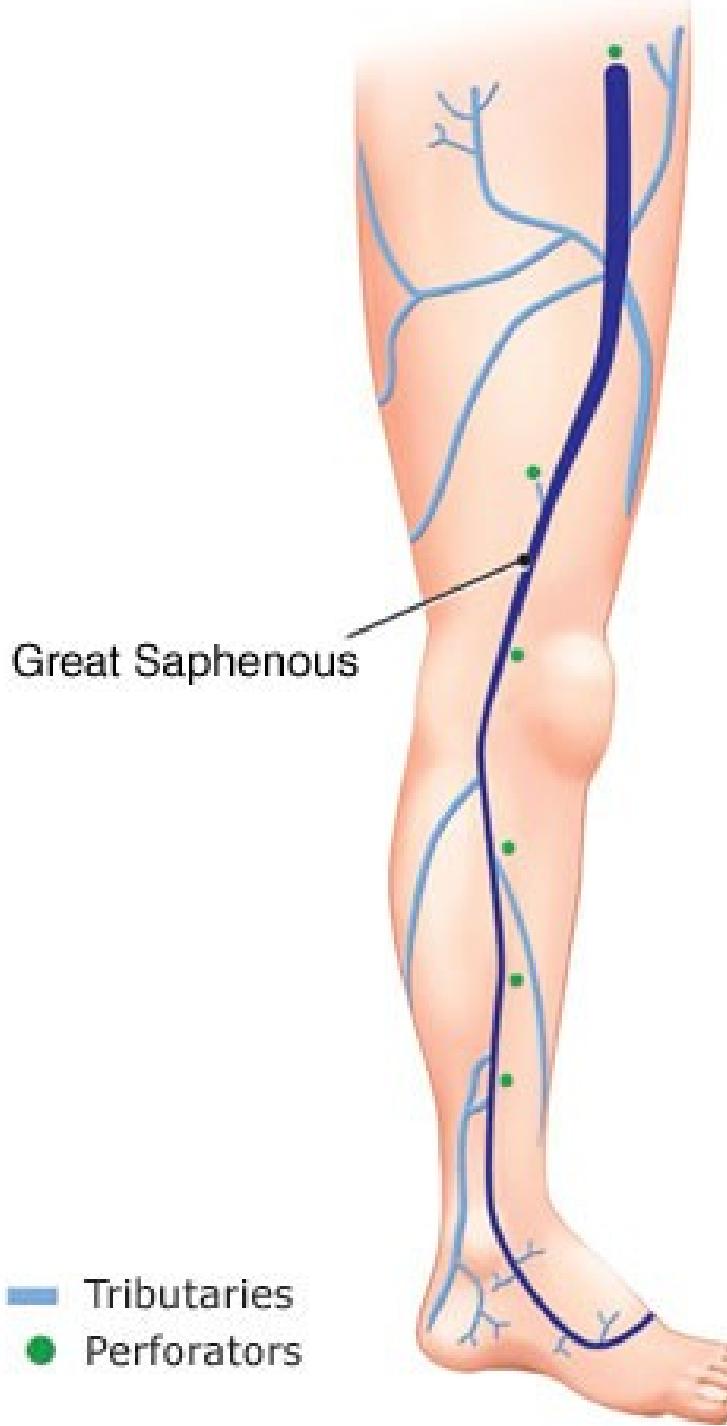
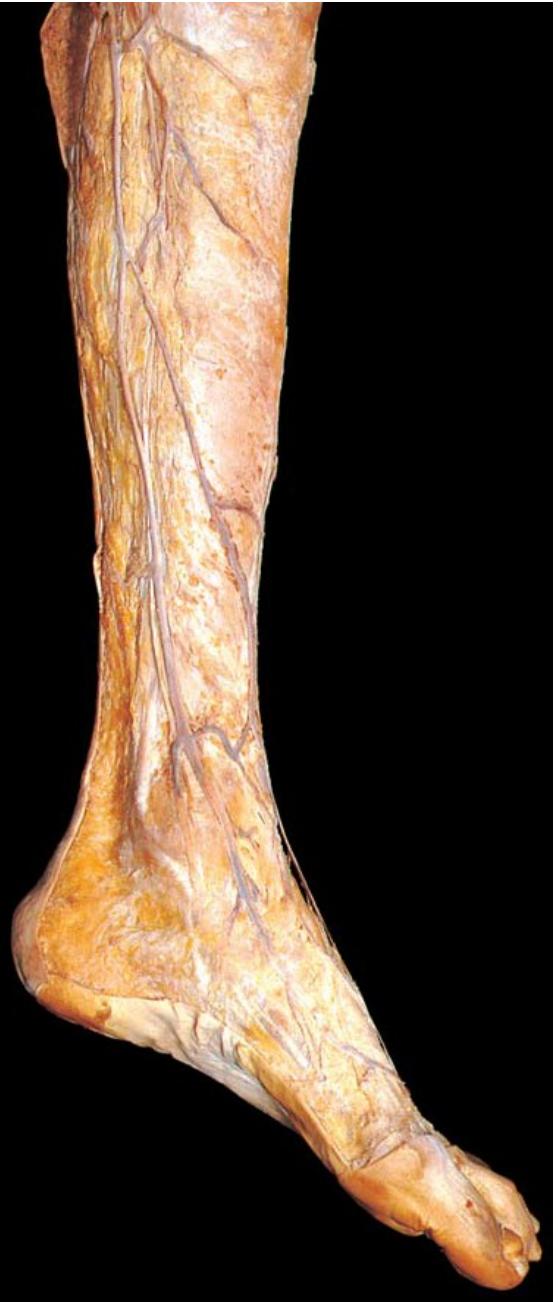


# Great Saphenous vein

- **Great Saphenous Vein**
- The longest vein in the body
- Begins from the medial end of the dorsal venous arch of the foot, receiving Dorsal metatarsal & Dorsal digital veins
- Passes upward in front of the medial malleolus with the saphenous nerve.
- Then it ascends in accompany with the saphenous nerve in the superficial fascia over the medial side of the leg.



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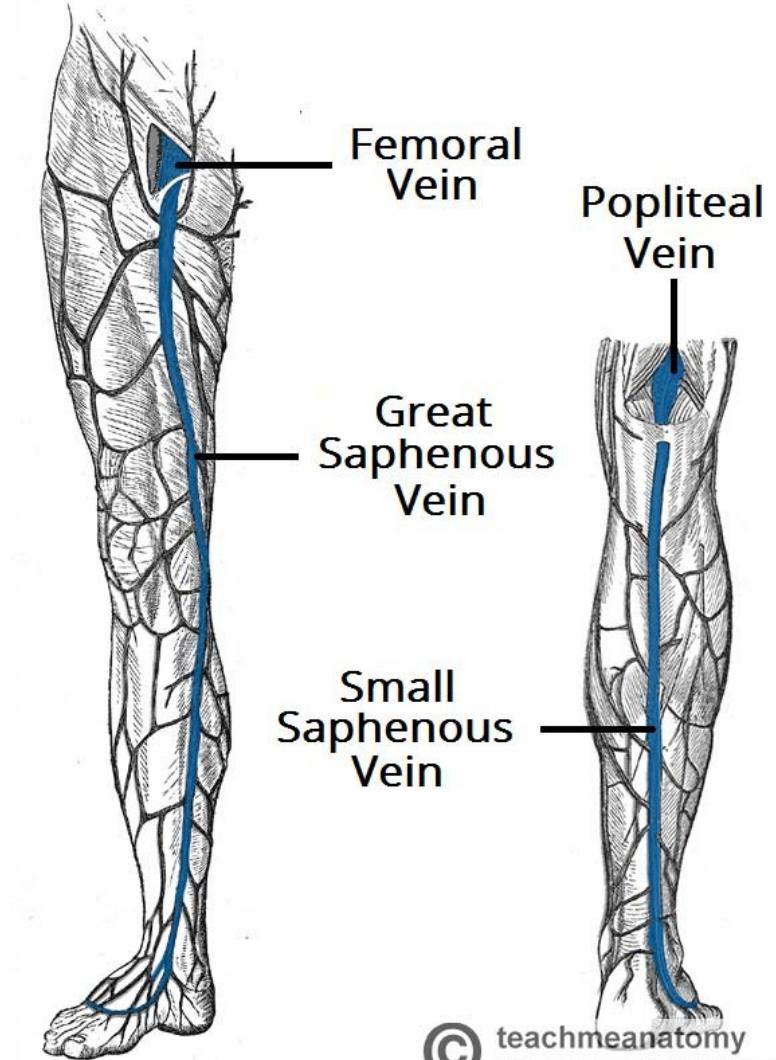




# Course & Relations

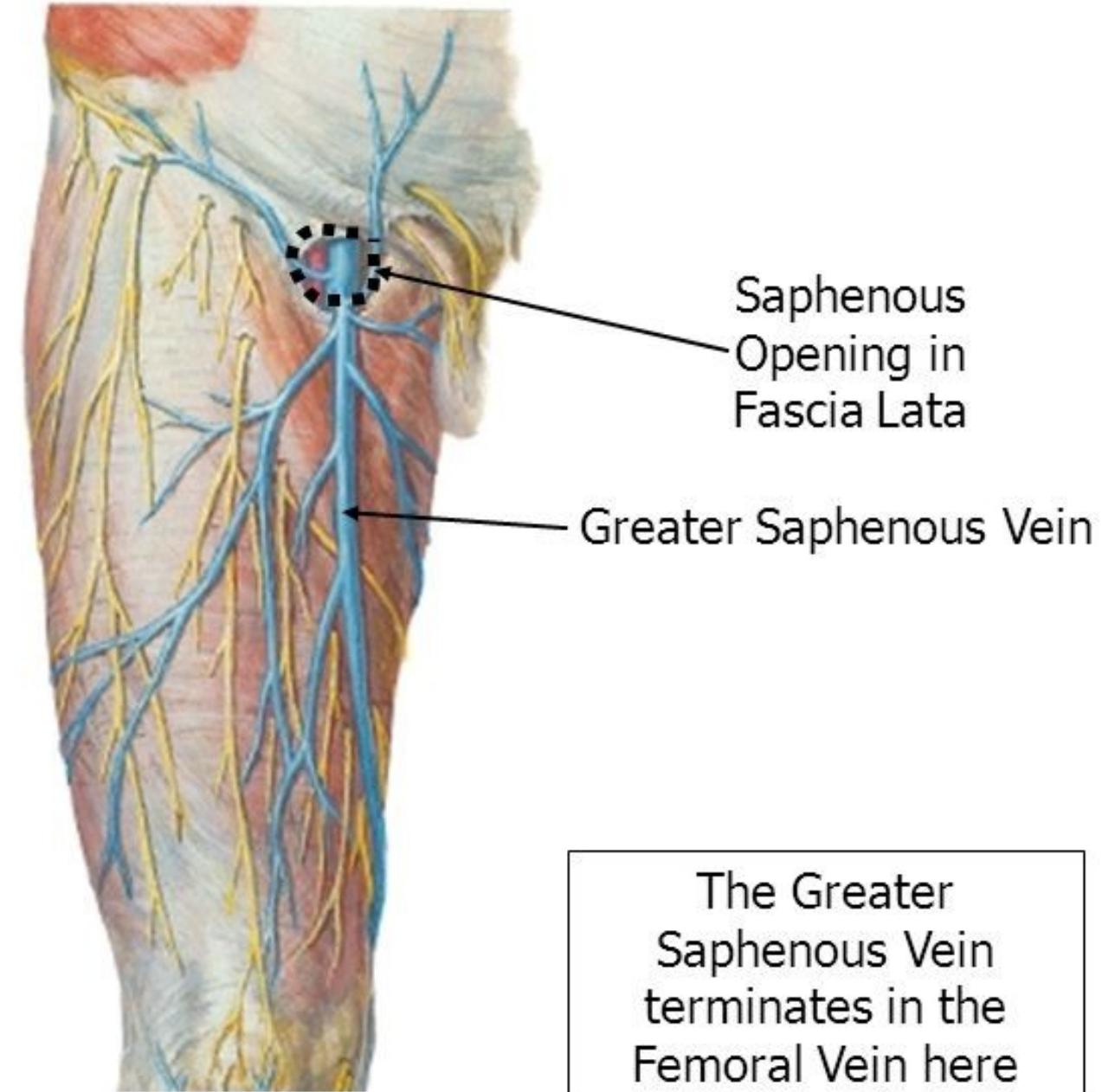
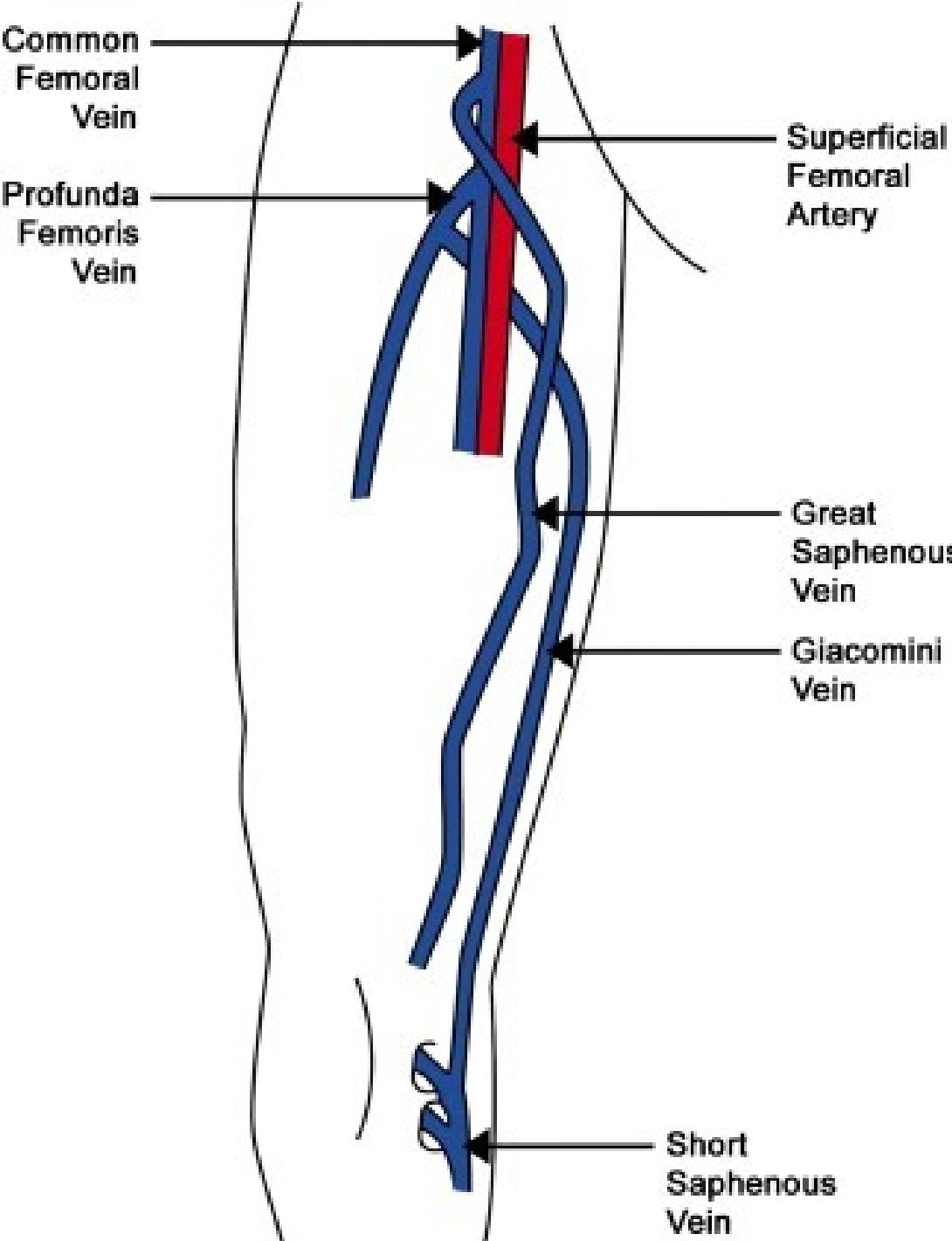
## Great Saphenous Vein (Cont.)

- Ascends obliquely upwards and lies behind the medial border of the patella. Passes behind the knee and curves forward around the medial side of the thigh towards its front.
- Hooks through the lower part of the saphenous opening in the deep fascia to joins the femoral vein about 1.5 in. (4 cm) below and lateral to the pubic tubercle.



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The #1 Applied Human Anatomy Site on the Web.

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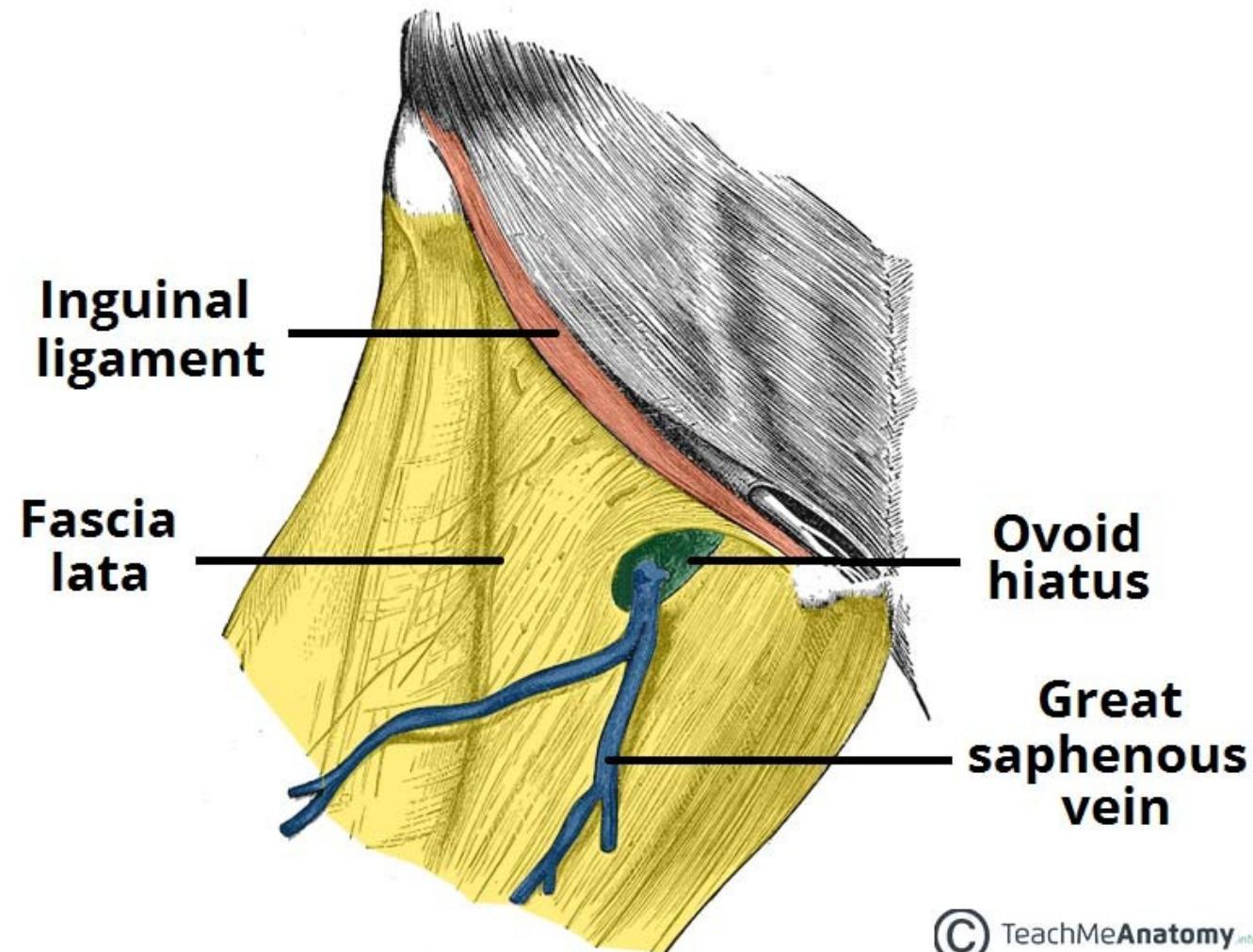


The Greater Saphenous Vein terminates in the Femoral Vein here



# Course & Relations

Pierce *cribriform*  
*fascia of saphenous*  
*opening* to end in  
**femoral vein**



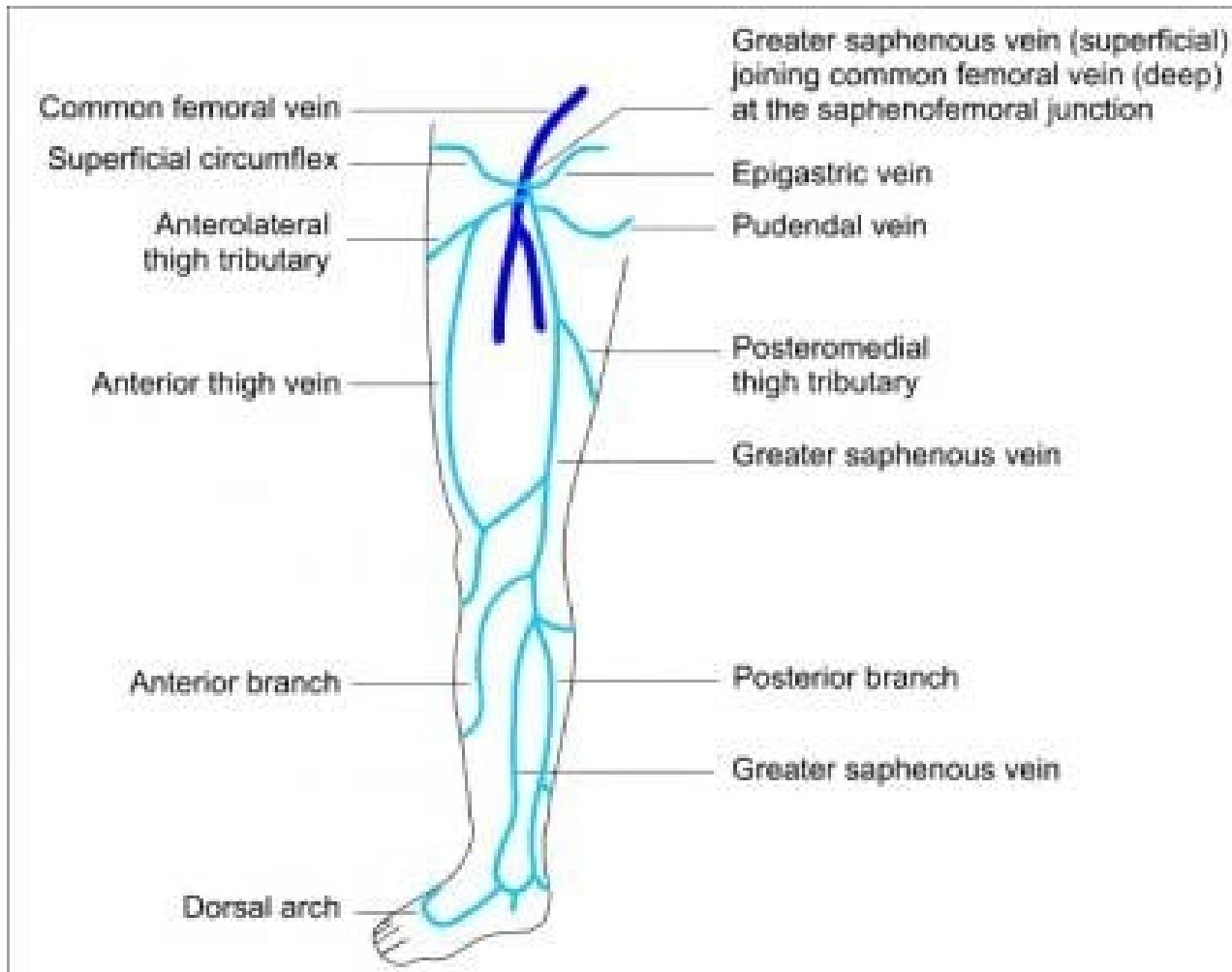
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# Tributaries

- 1. Superficial circumflex iliac**
- 2. Superficial epigastric**
- 3. Superficial external pudendal**
- 4. Communicate with short saphenous**
- 5. Communicate with deep veins via perforating veins**

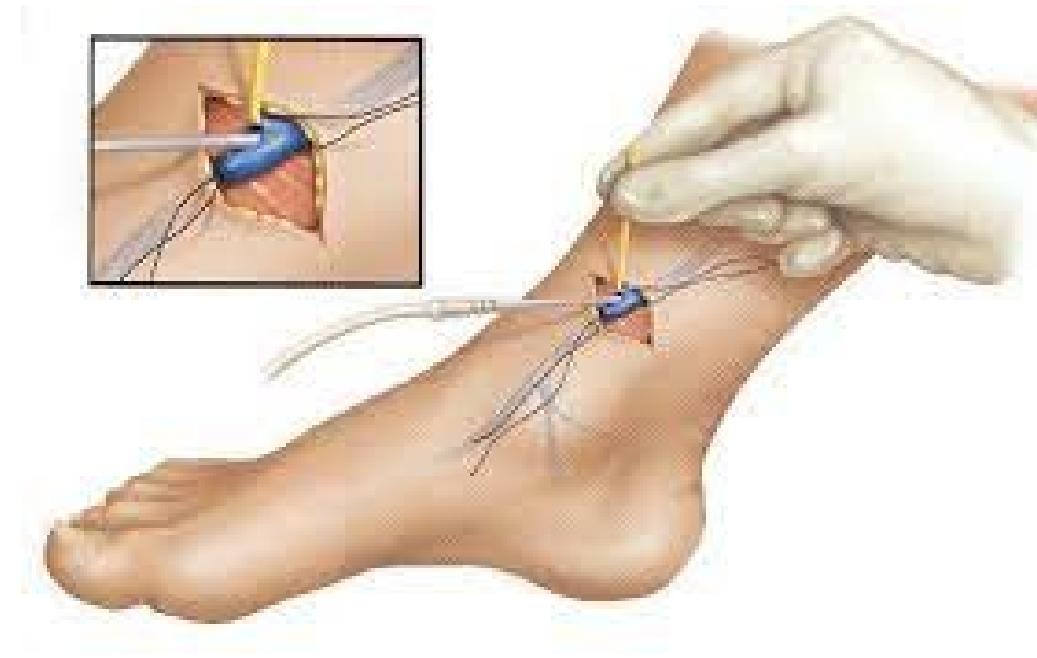


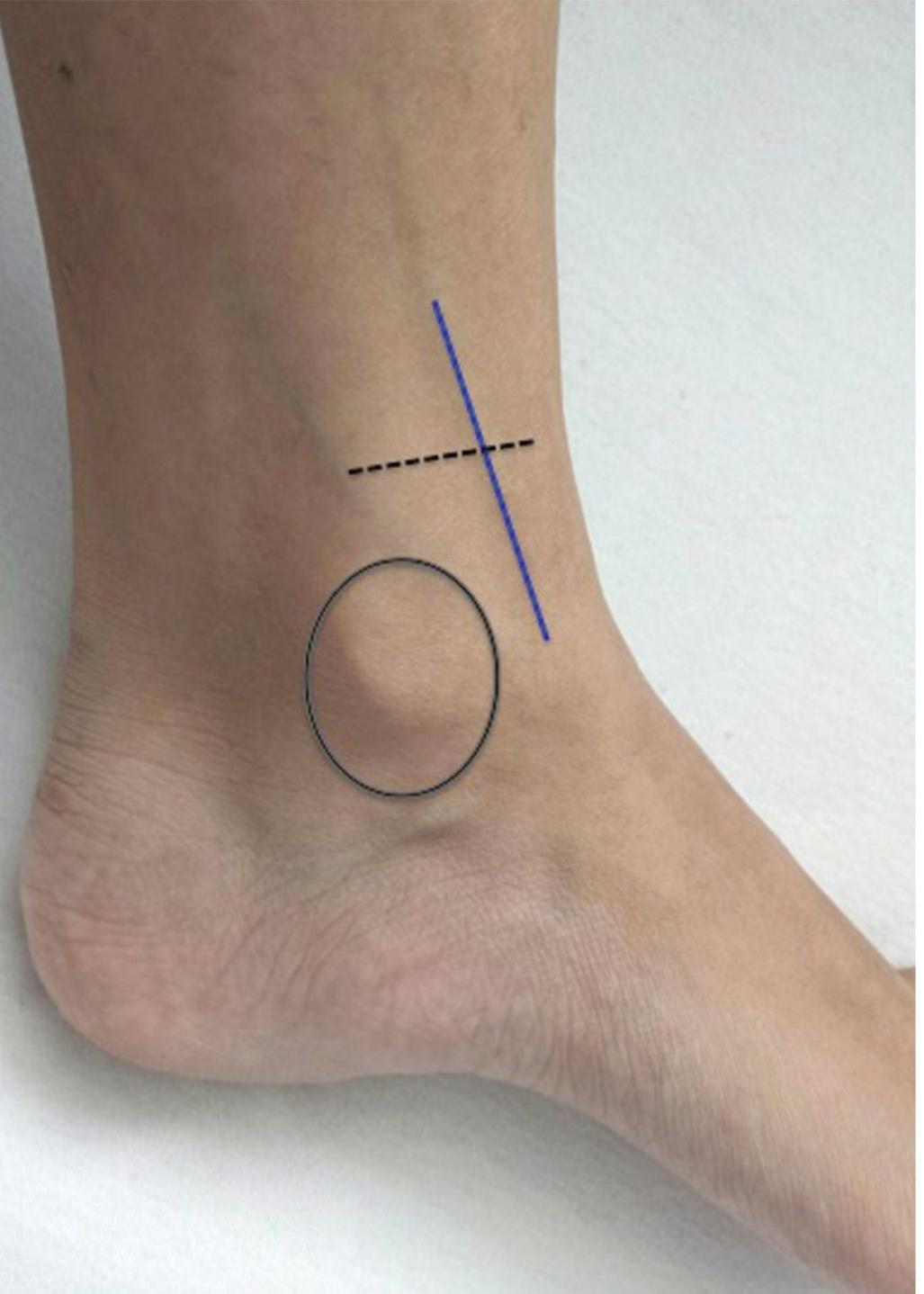
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# Venous Cutdown

An **emergency procedure** in which the vein is exposed surgically and then a cannula is inserted into the vein under direct vision.

It is used to get vascular access in **trauma and hypovolemic shock patients** when peripheral cannulation is difficult or impossible

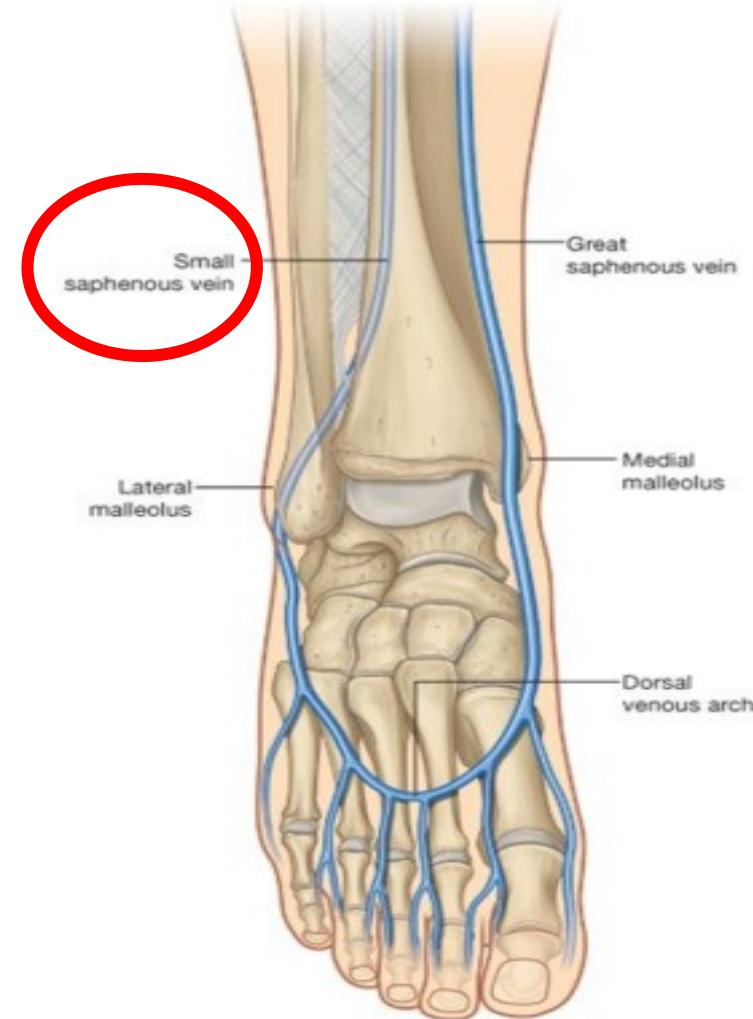






# ***Small Saphenous Vein***

- Arises from the lateral end of the dorsal venous arch. Ascends behind the lateral malleolus in company with the sural nerve.
- Follows the lateral border of the tendocalcaneus and then runs up to the middle of the back of the leg.
- Pierces the deep fascia in the lower part of the popliteal fossa

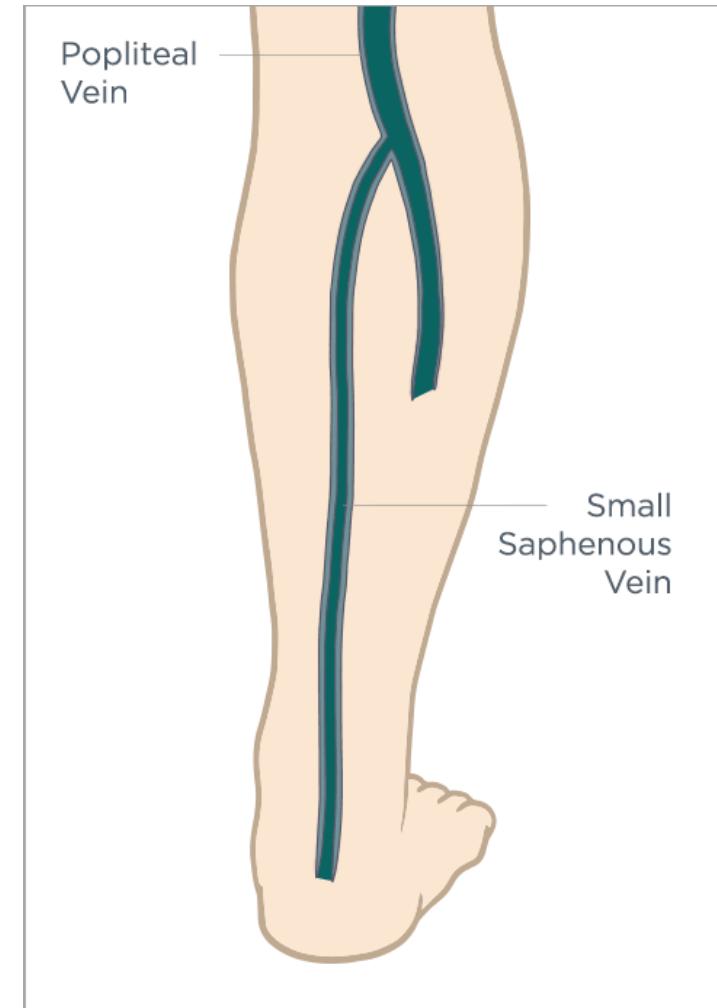


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# ***Small Saphenous Vein***

- Drains into the popliteal vein
- Has numerous valves along its course.
- Anastomosis freely with great saphenous vein.



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# *Course and Relations*

**Pass in the back of leg  
lateral to  
tendocalcaneus then  
towards midline**

**Pierce deep popliteal  
fascia to end in  
popliteal vein**



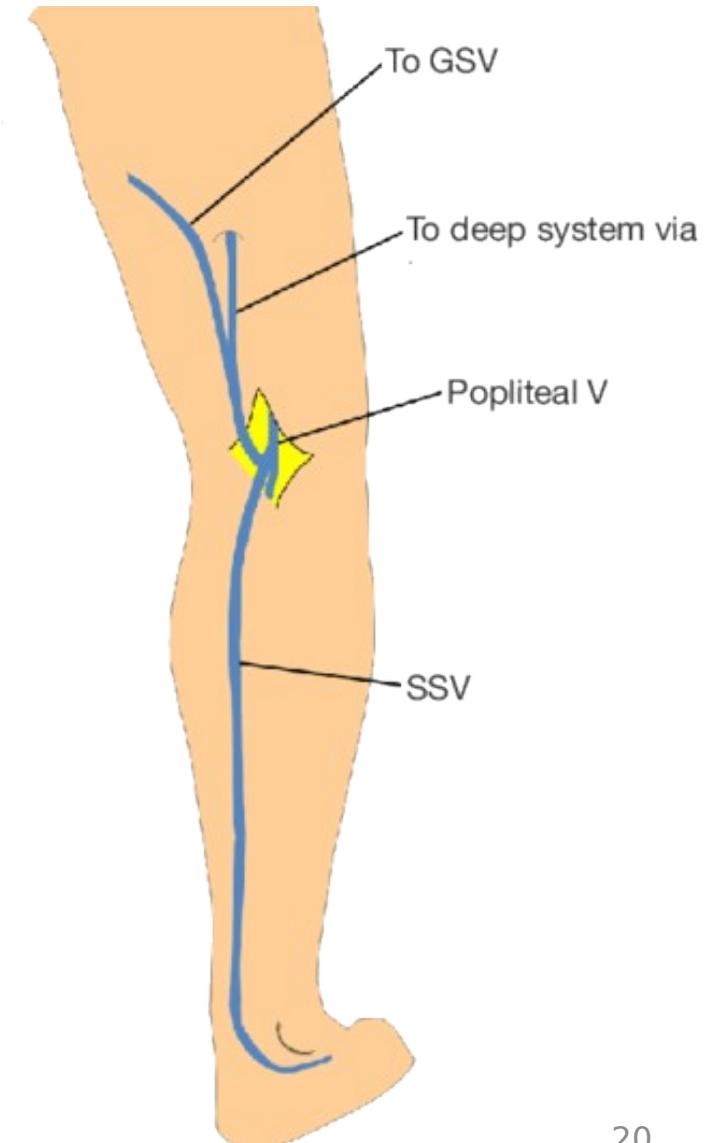
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# Tributaries

**1. Communicate with great saphenous**

**2. Communicate with deep veins via perforating veins**



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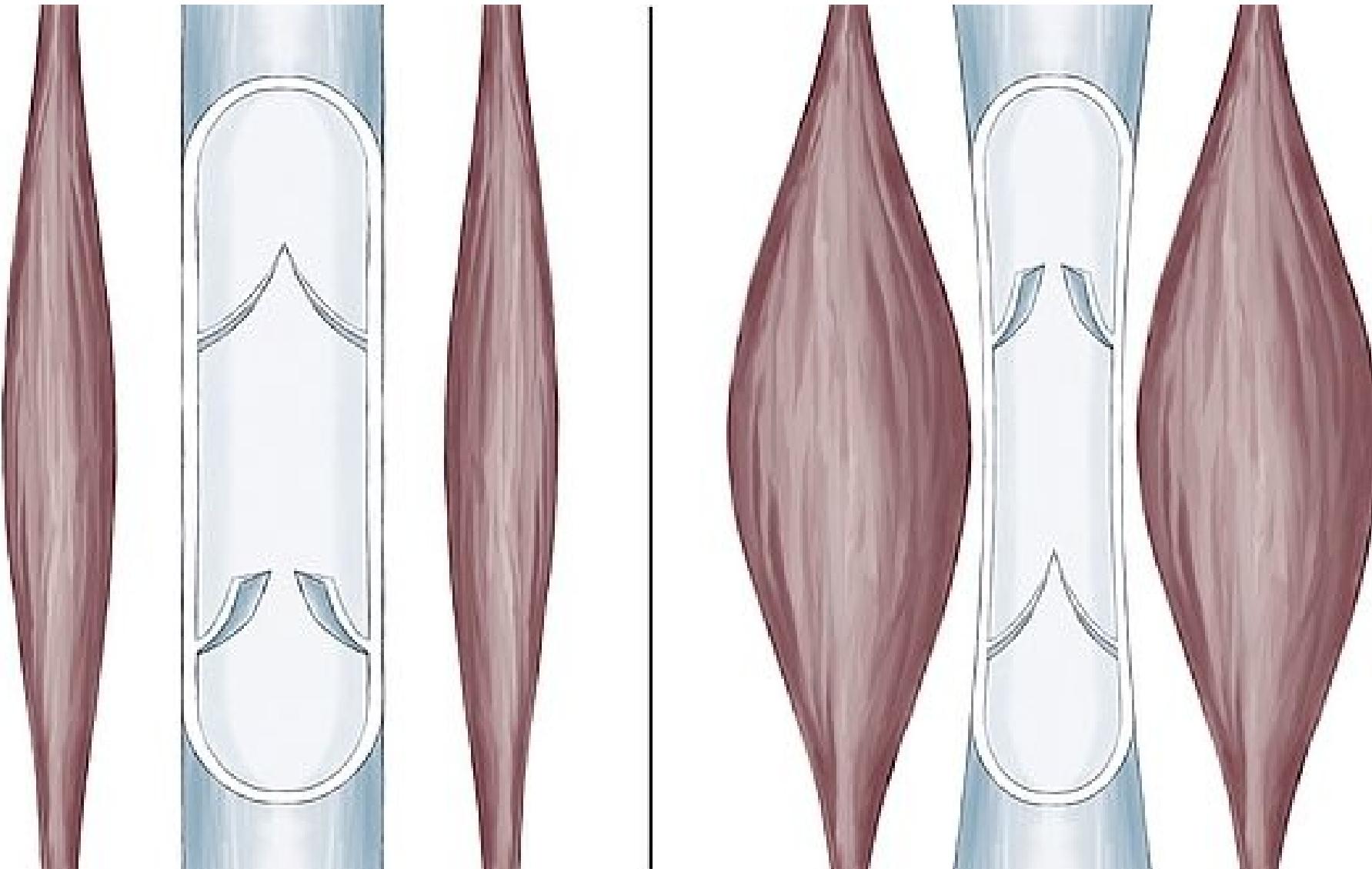
# ***Venous Return in LL***

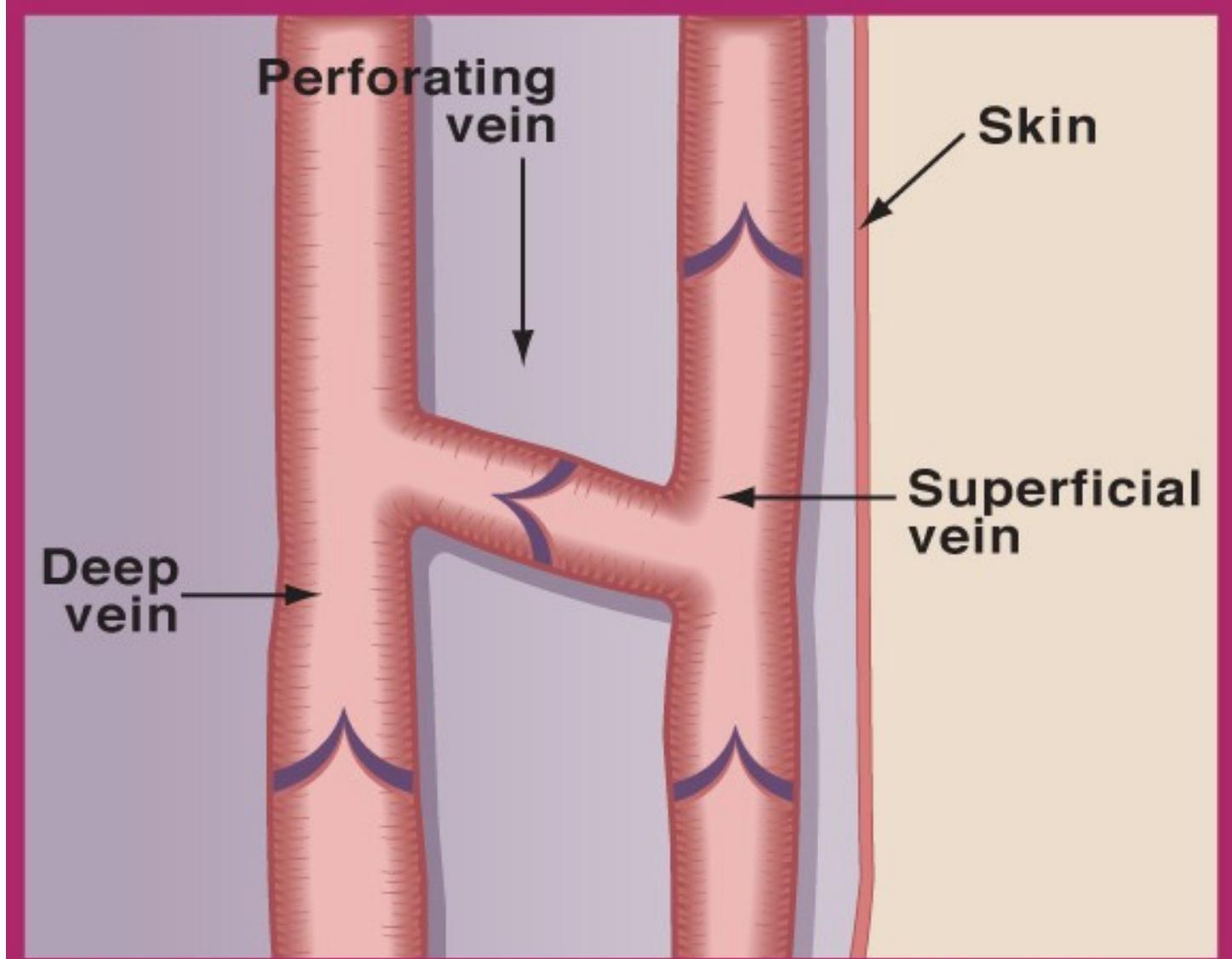
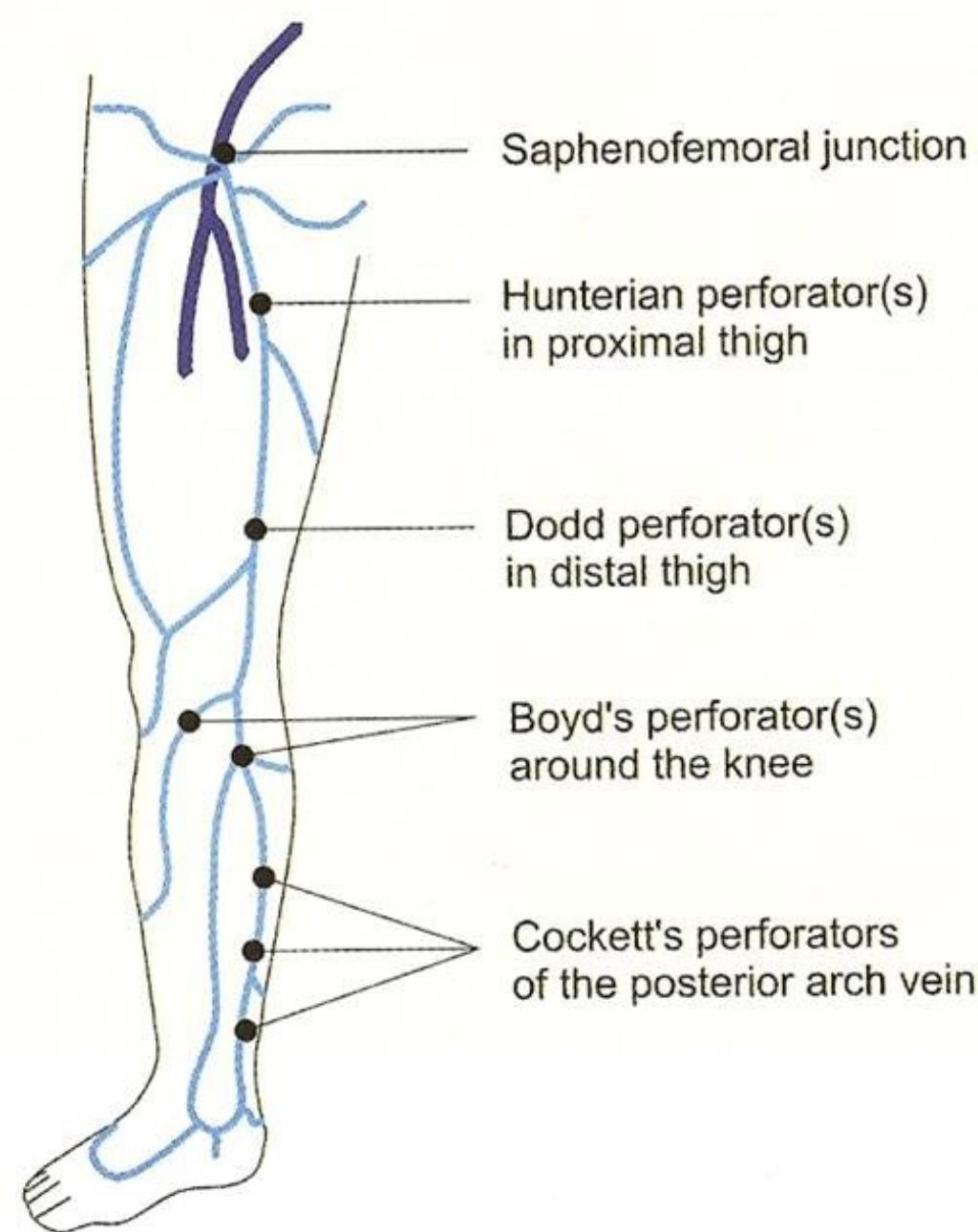


- Much of the saphenous blood passes from superficial to deep veins through the perforating veins
- The blood is pumped upwards in the deep veins by the contraction of the calf muscle.
- This action of '**calf pump**' is assisted by the tight sleeve of deep fascia surrounding these muscles.



# *Venous Return in LL*

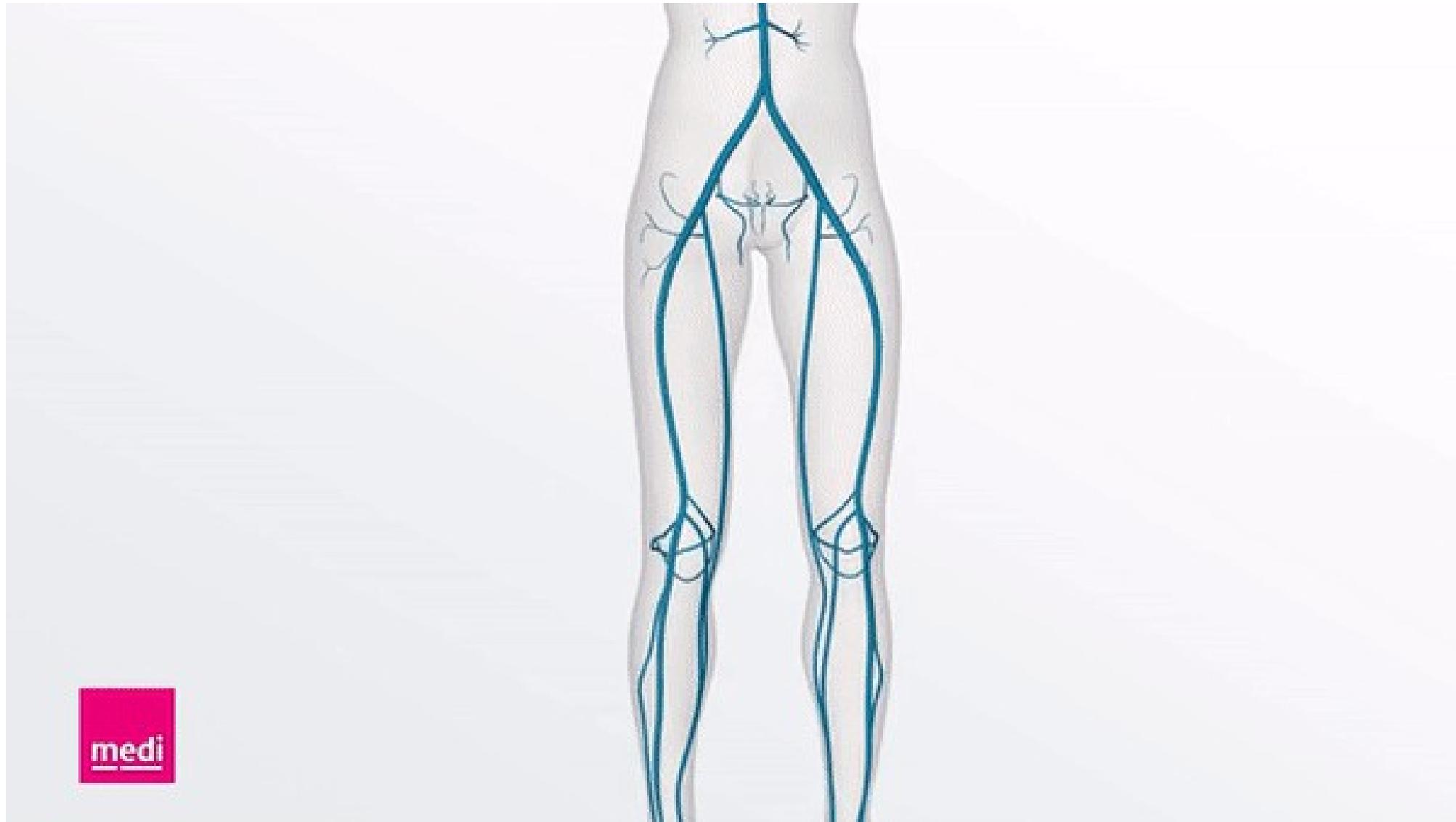




**Perforating veins connect the deep system with the superficial system**

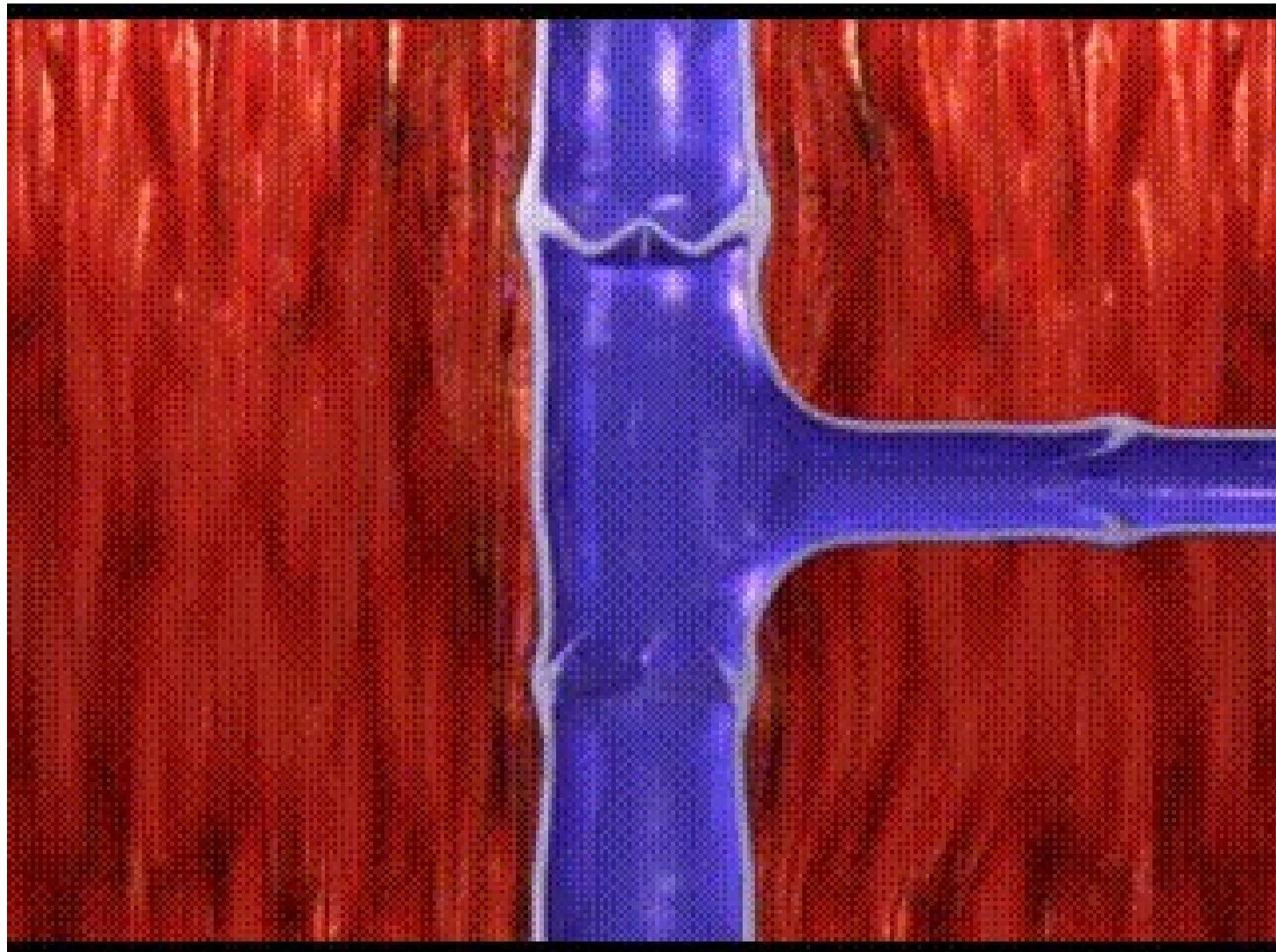
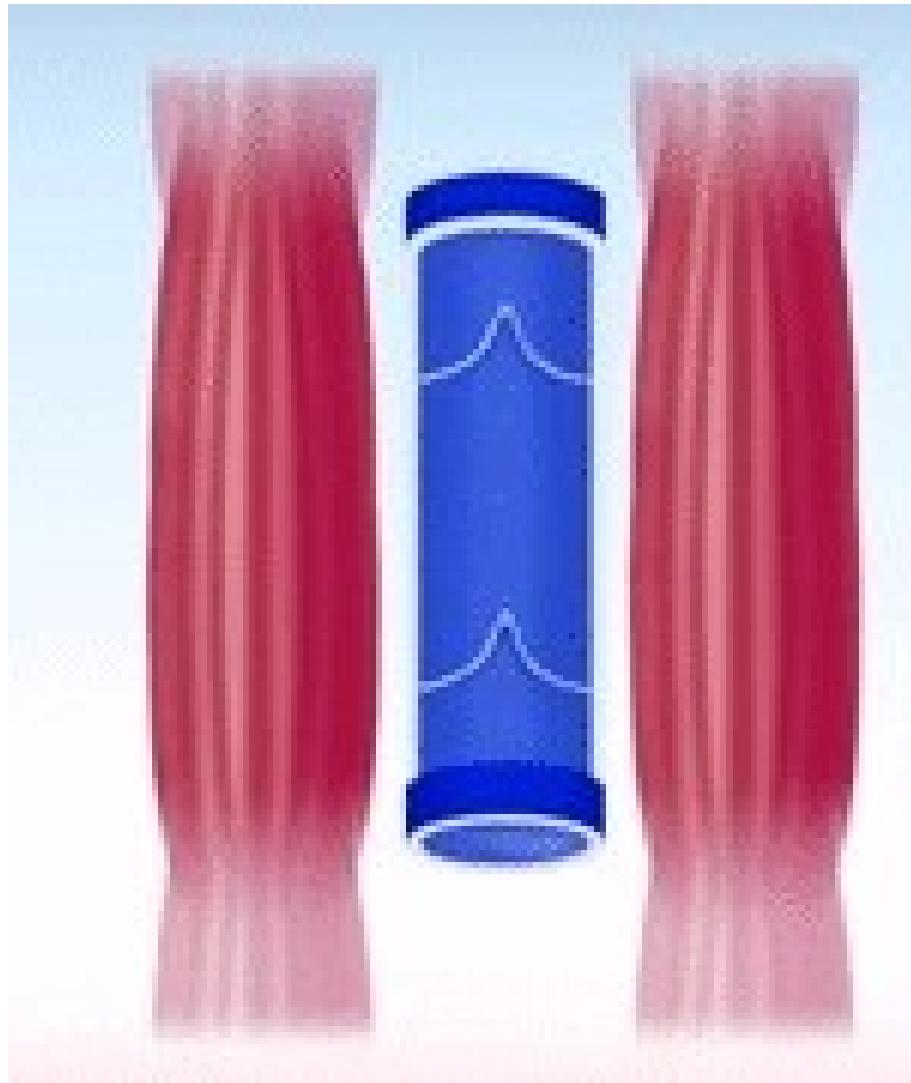


# *Venous Return in LL*





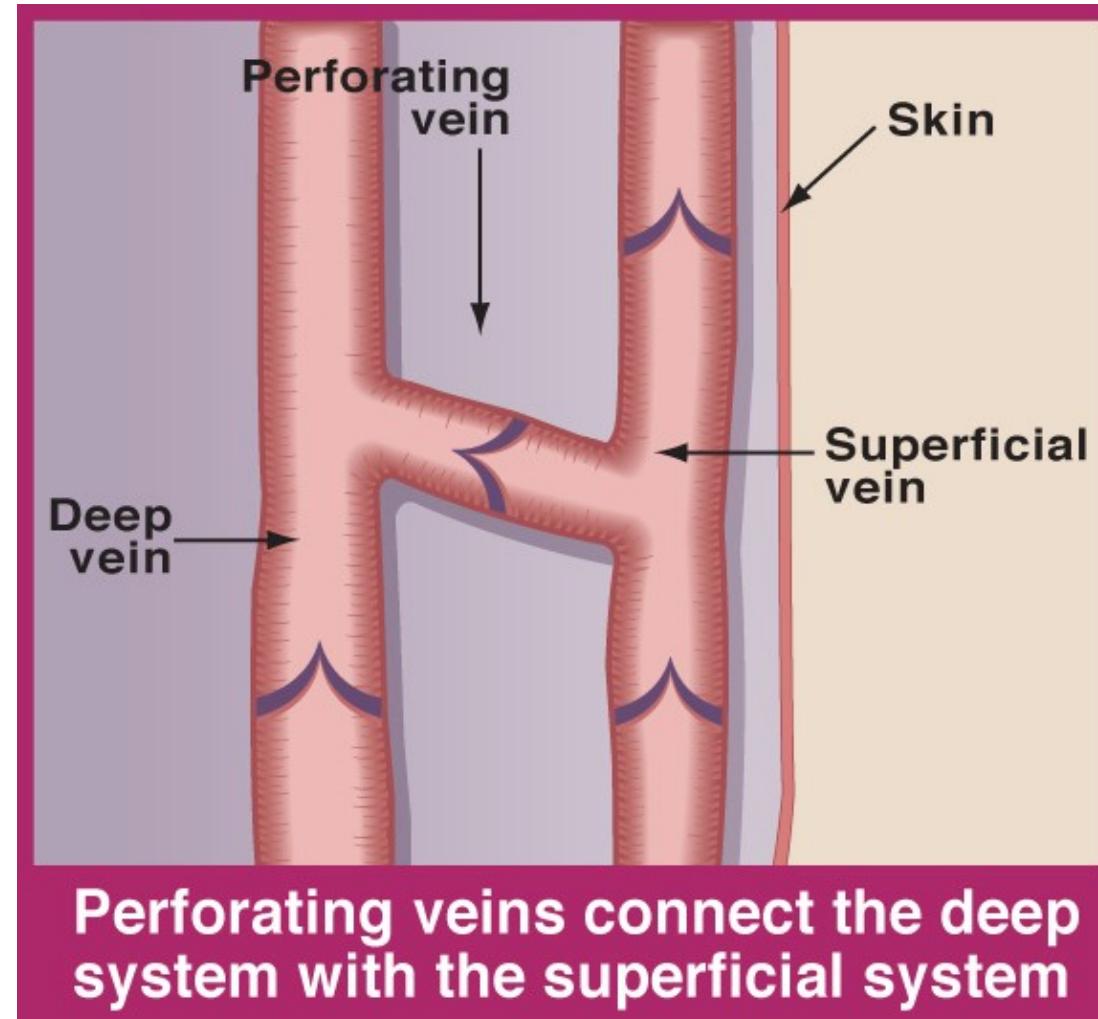
# *Venous Return in LL*



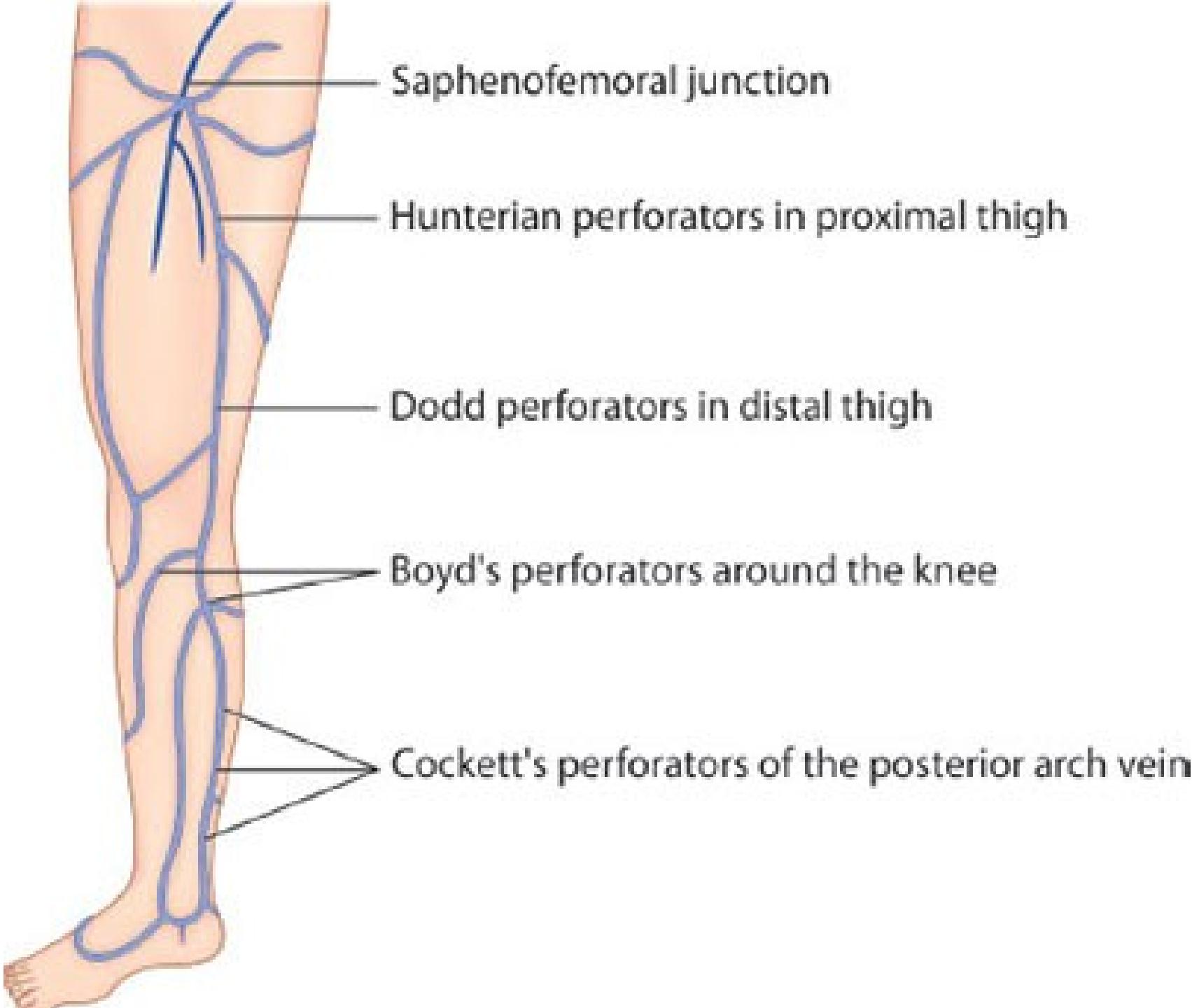


# Lower Limb Perforators

- They contain valves which normally allow the blood to flow from superficial to deep veins.
- They pass through the deep fascia at an oblique angle so during muscular contraction , they are compressed. This also prevents blood flowing from the deep to the superficial veins..

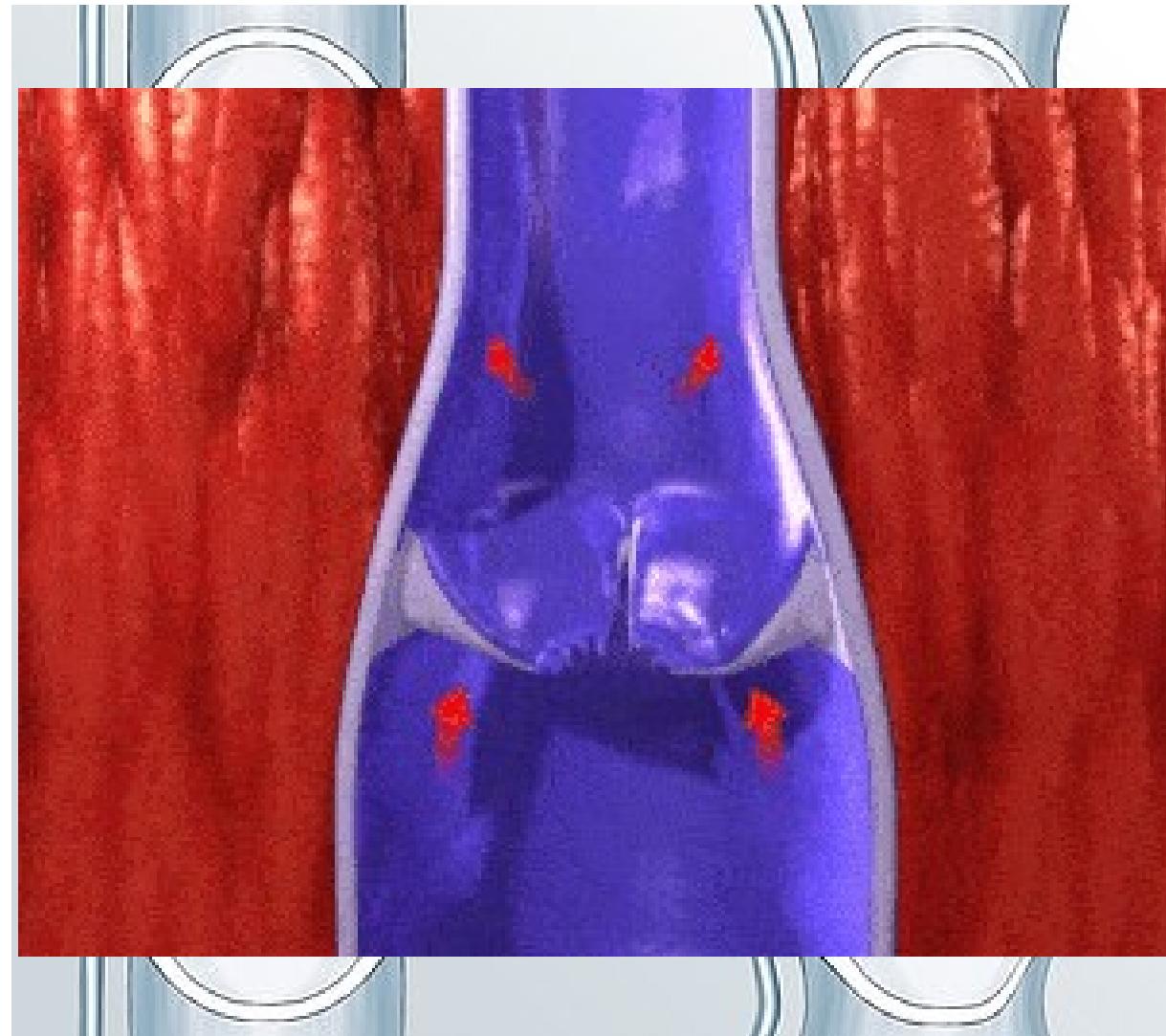


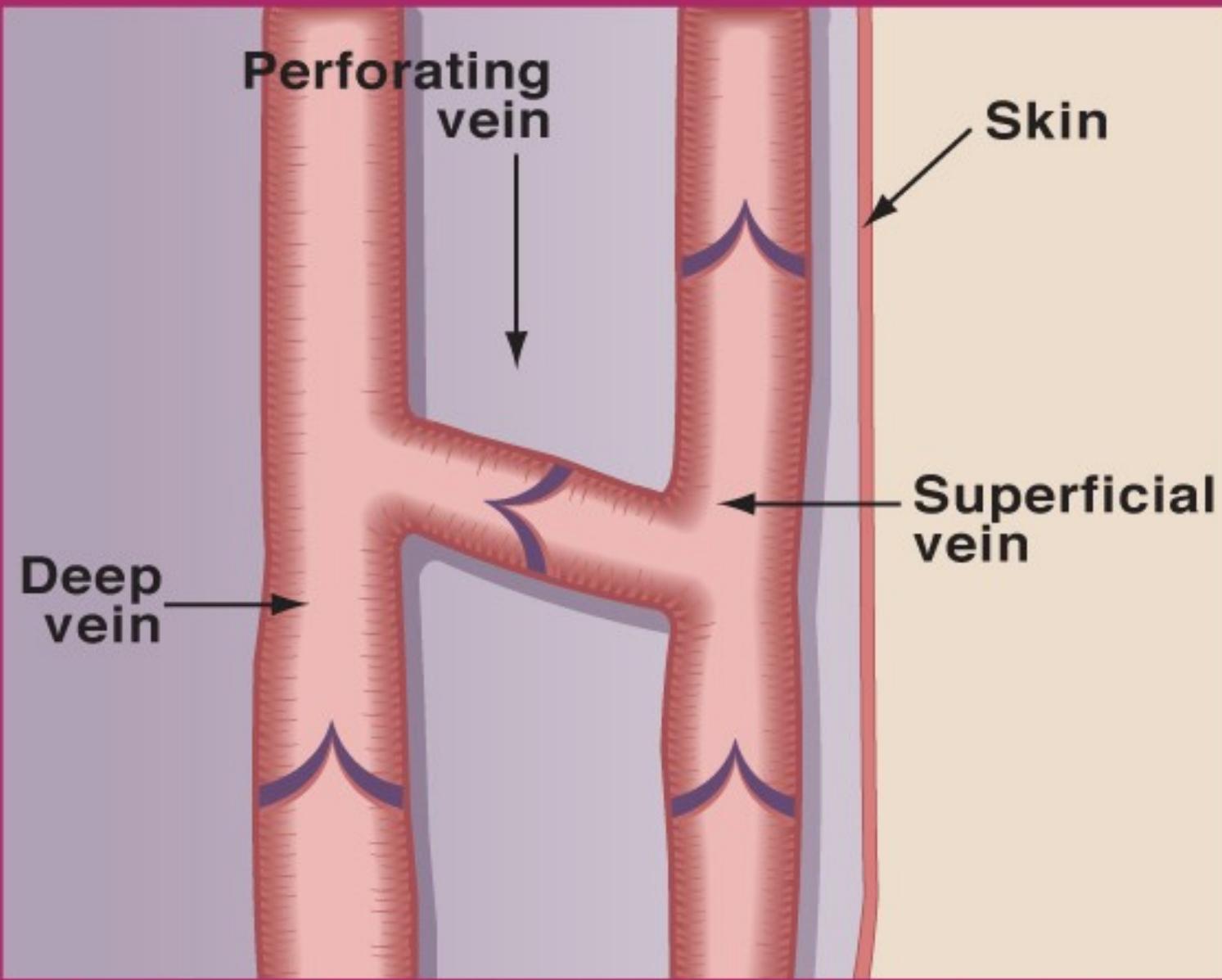
**Perforating veins connect the deep system with the superficial system**



# Varicose Veins

- If the valves in the perforating veins become incompetent, the direction of blood flow is reversed, and the veins become varicosed.
- Most common in posterior & medial parts of the lower limb, particularly in old people.
- This allows passage of high-pressure blood from deep to superficial veins.

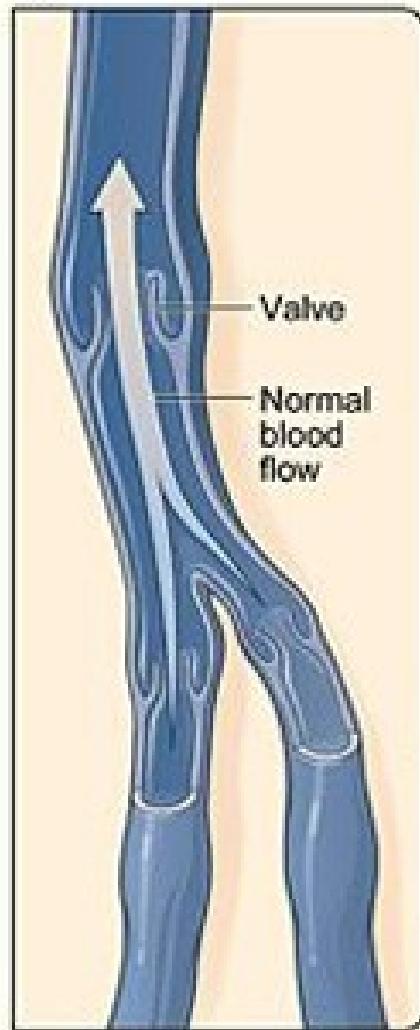




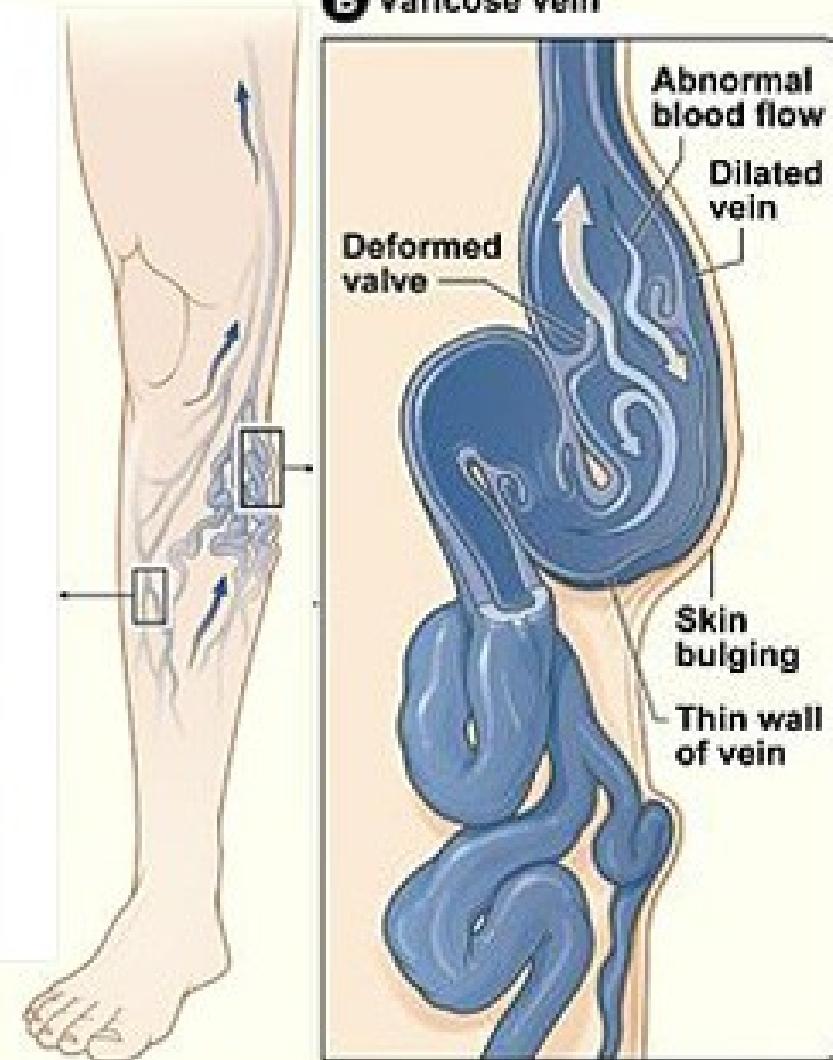
Perforating veins connect the deep system with the superficial system

# Venous Return in LL

**A** Normal vein



**B** Varicose vein



# ***Deep Veins of the LL***



- Comprise the venae comitans, which accompany all the large arteries, usually in pairs.
- Venae comitans unite to form the popliteal vein, which continues as the femoral vein.
- Receive blood from superficial veins through perforating veins.



# Deep Veins of the LL

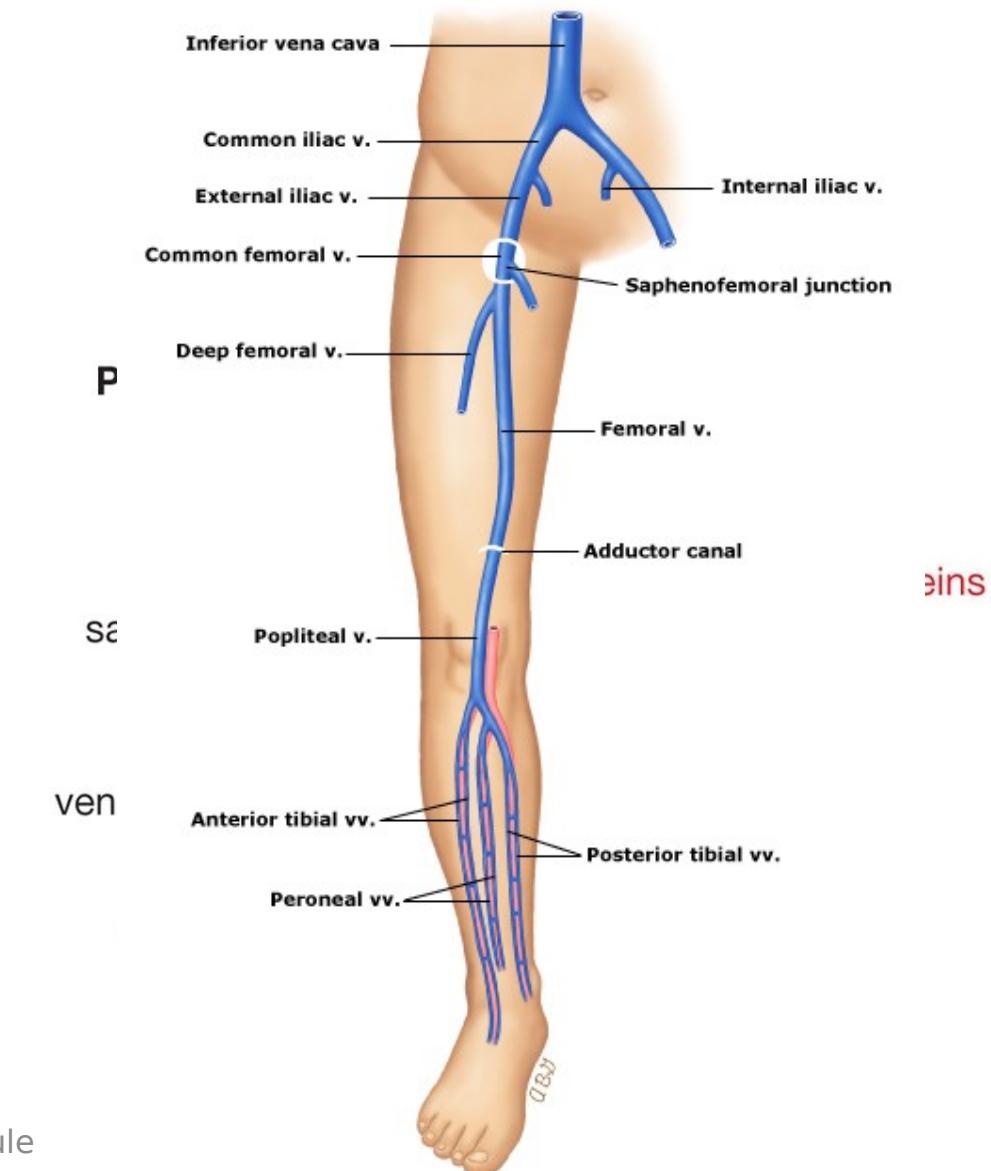
- **Main deep veins of the lower limb include:**

1. **Femoral Vein - 1**

2. **Popliteal vein - 1**

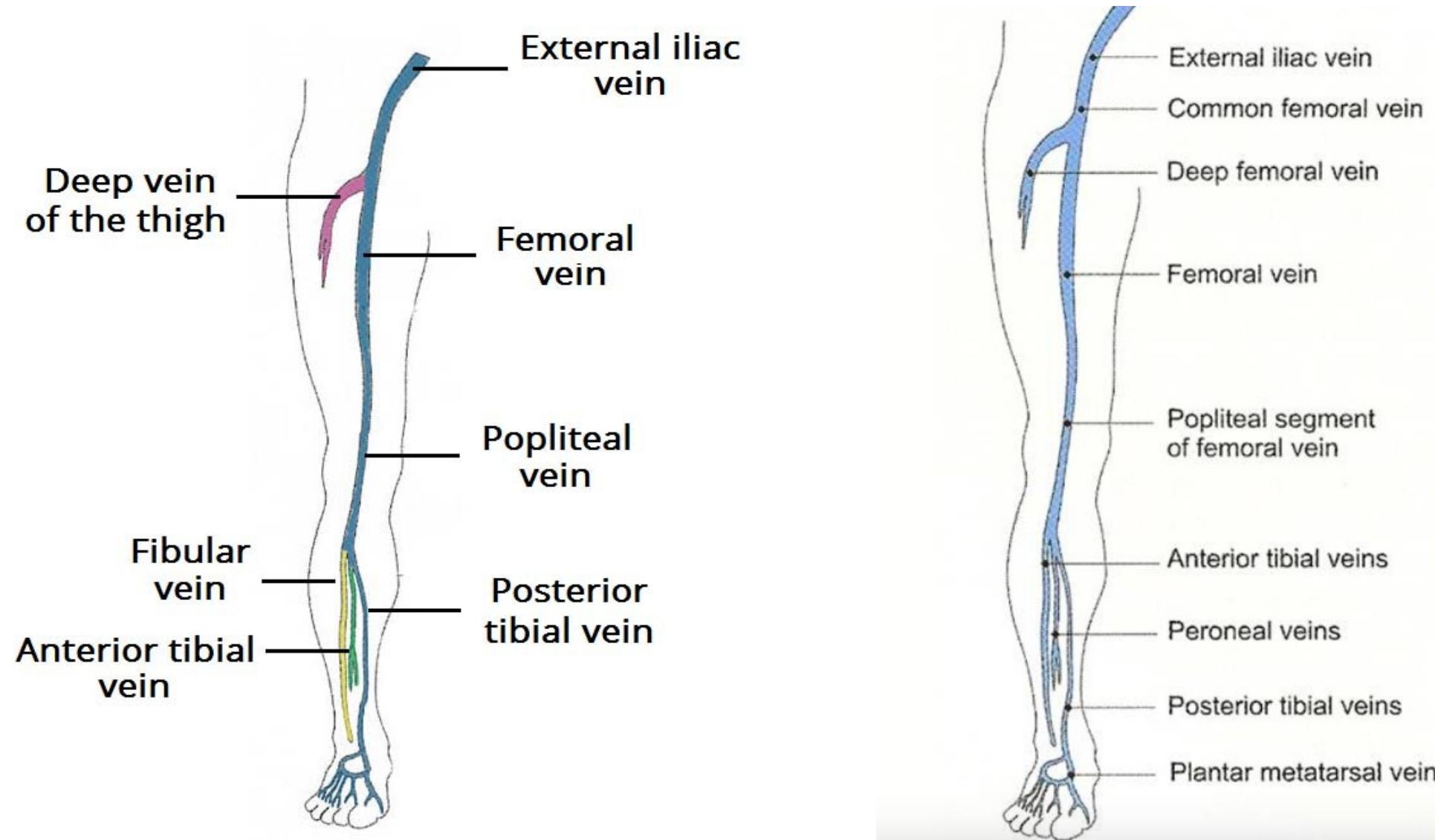
3. **Peroneal vein - 1**

4. **Anterior tibial vein & Posterior tibial vein - 2**





# Deep Veins of the LL





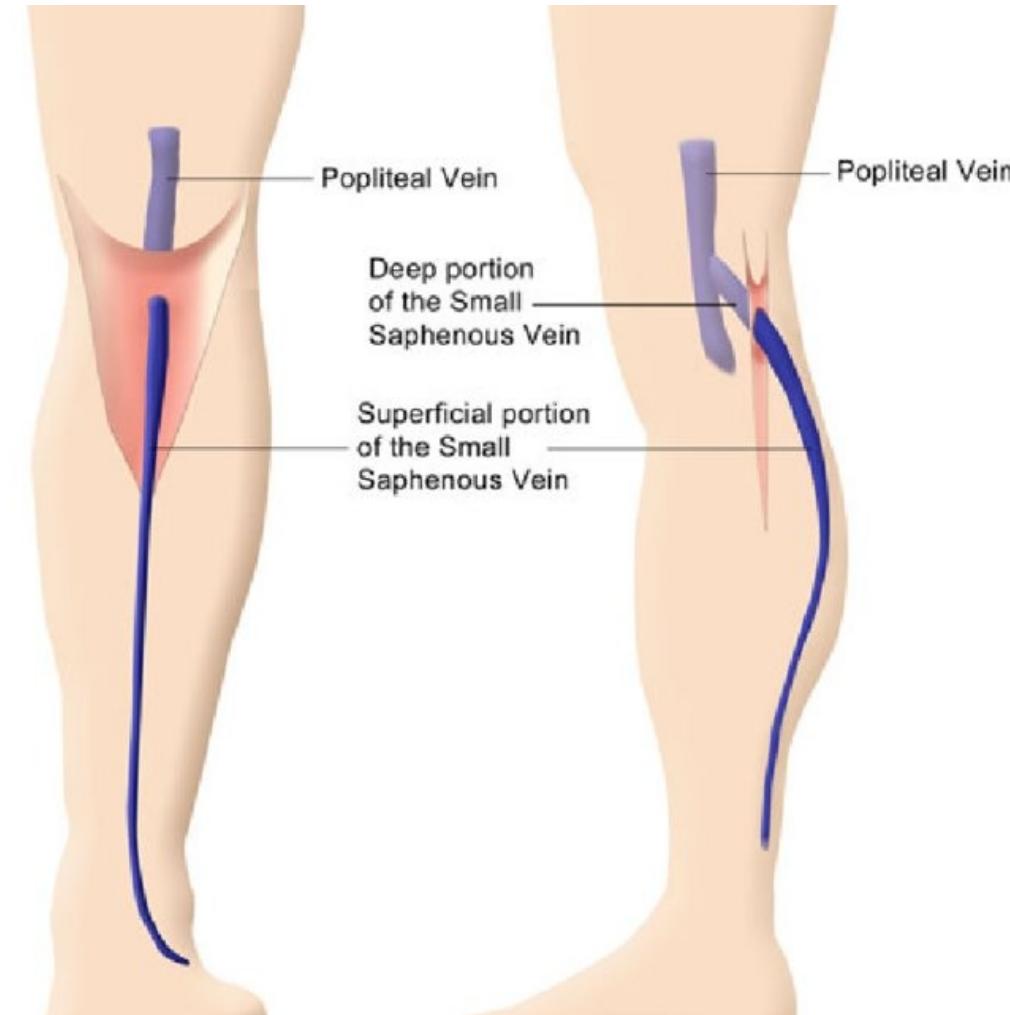
# Popliteal Vein

**Beginning:** at lower border of popliteus by union of venae comitantes of ant & post tibial art

**Termination:-**by passing via adductor hiatus & continues as femoral vein.

## Tributaries:

1. Small saphenous vein.
2. Veins corresponding to the branches of the popliteal artery.
3. Muscular veins.



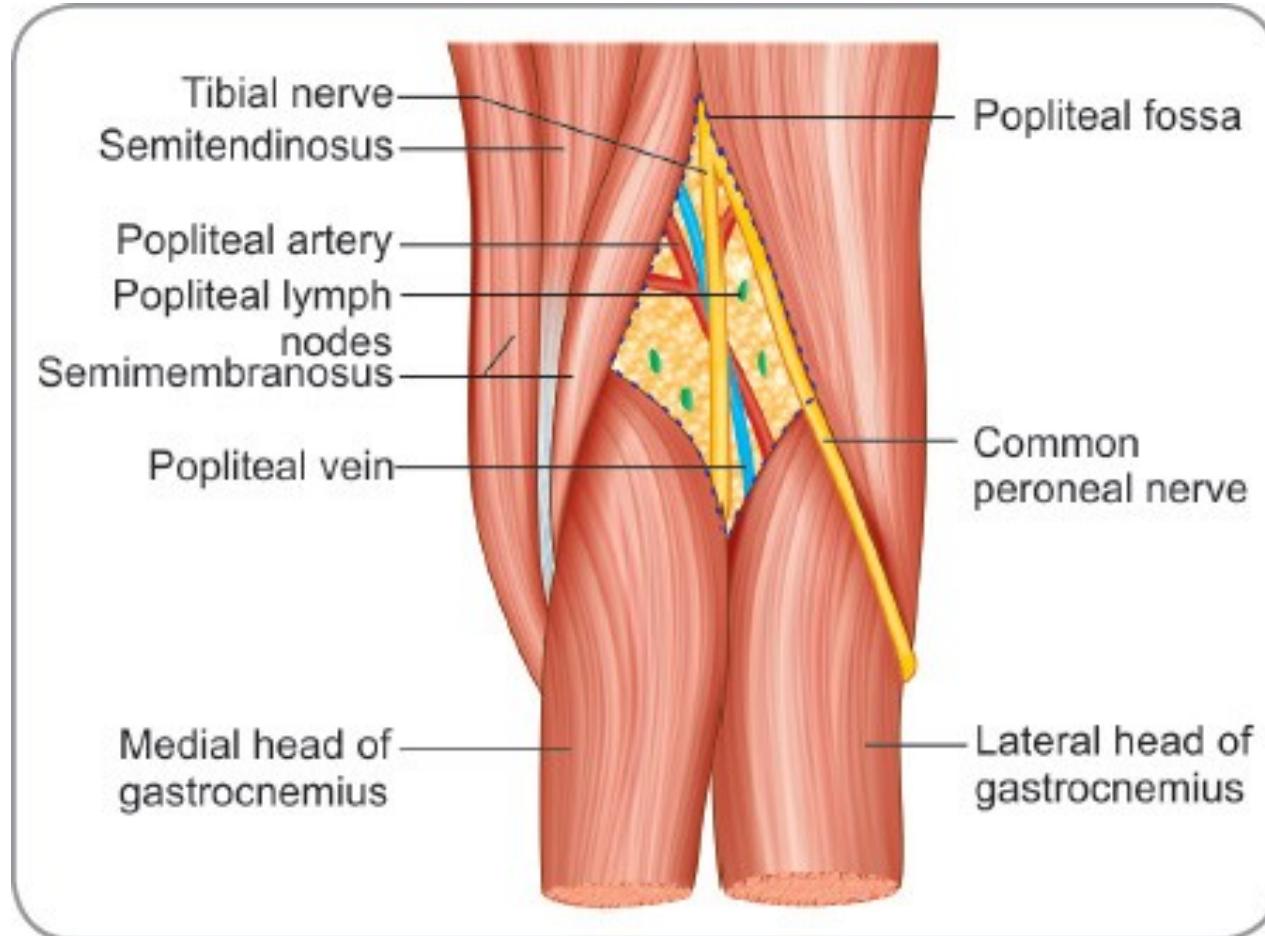


# Popliteal Vein

## ***Course and relations:***

**Has triple relations to the popliteal artery:**

1. In **lower** part of the fossa: ***medial*** to artery.
2. In **middle** part of the fossa: ***posterior*** to it
3. In **upper** part of the fossa: ***lateral*** to the it.





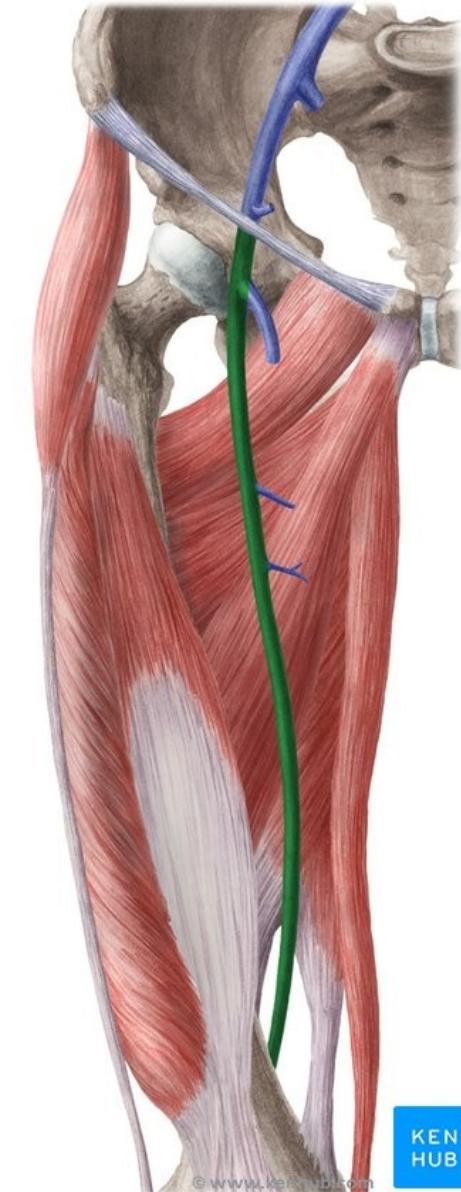
# Femoral Vein

**Beginning:** continuation of popliteal vein through adductor hiatus.

**Termination:** continues as external iliac vein behind inguinal ligament medial to femoral *artery*.

***Course and relations:***

- 1. In the adductor canal** it ascends posterolatera to the femoral artery then posterior to it.
- 2. In the femoral triangle** it passes posterior to become posteromedial then medial to the artery

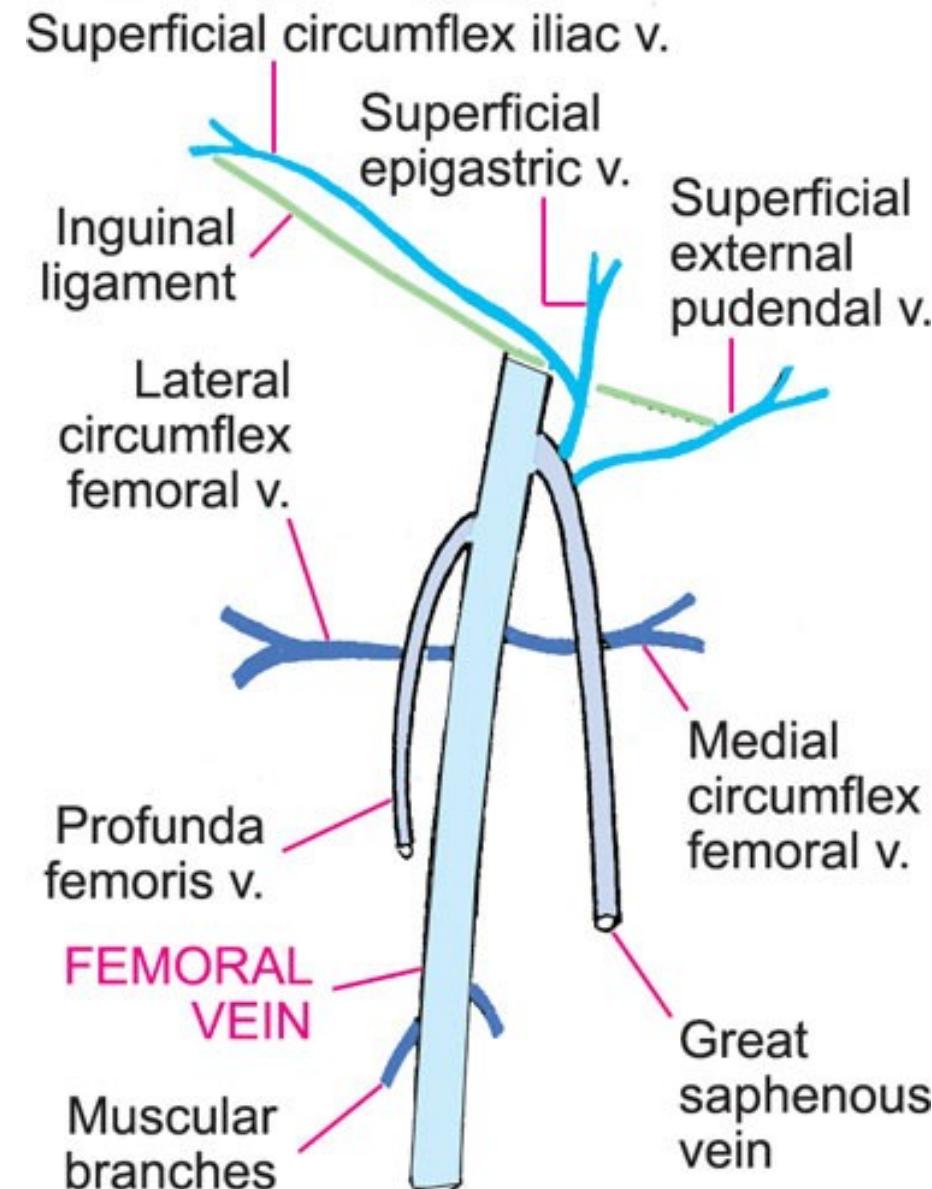




# Femoral Vein

## Tributaries:

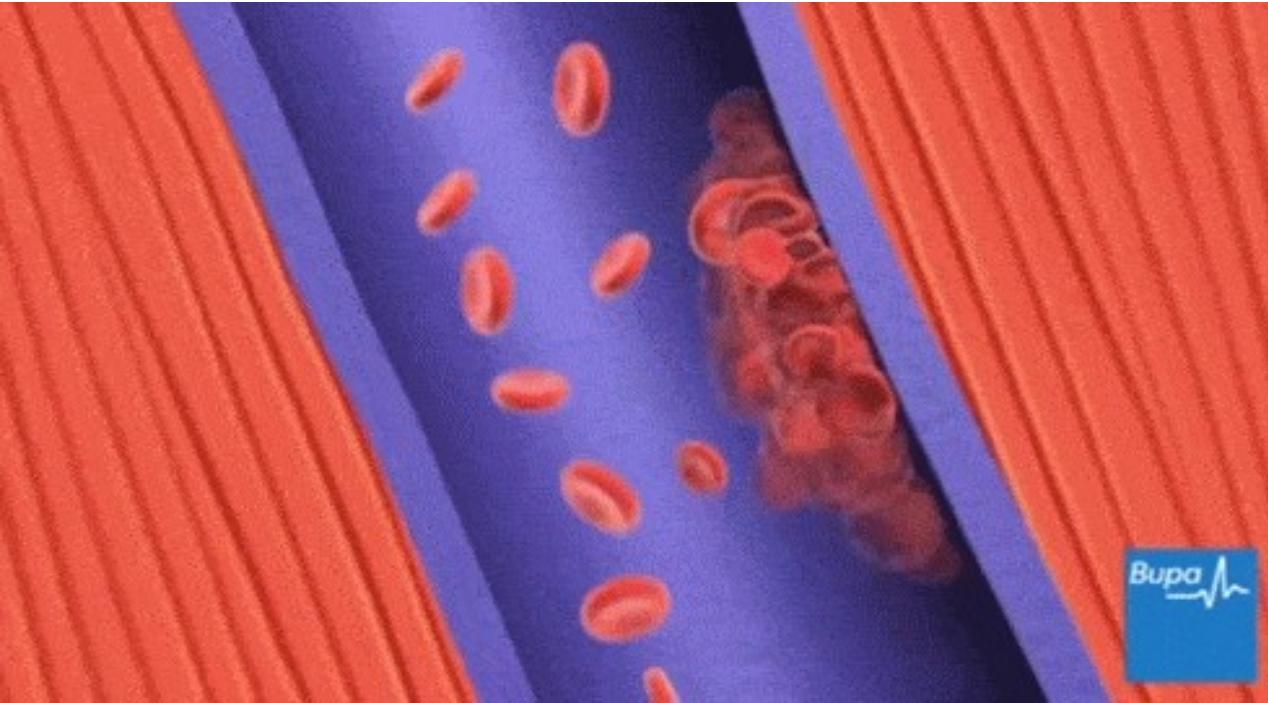
1. Profunda femoris vein.
2. Medial and lateral circumflex femoral veins.
3. Deep external pudendal vein.
4. Great saphenous vein.
5. Muscular veins.



# **Deep Venous Thrombosis DVT**



- The veins of lower limb are subject to venous thrombosis after a **bone fracture**.
- **Venous stasis** is the main cause by pressure on the veins from the bedding during **prolonged hospital stay**.
- **Pulmonary embolism** may occur when a thrombus breaks free from the lower limb vein and passes to the lungs.



# **Lecture Quiz**



***One of the following veins pass behind lateral malleolus:***

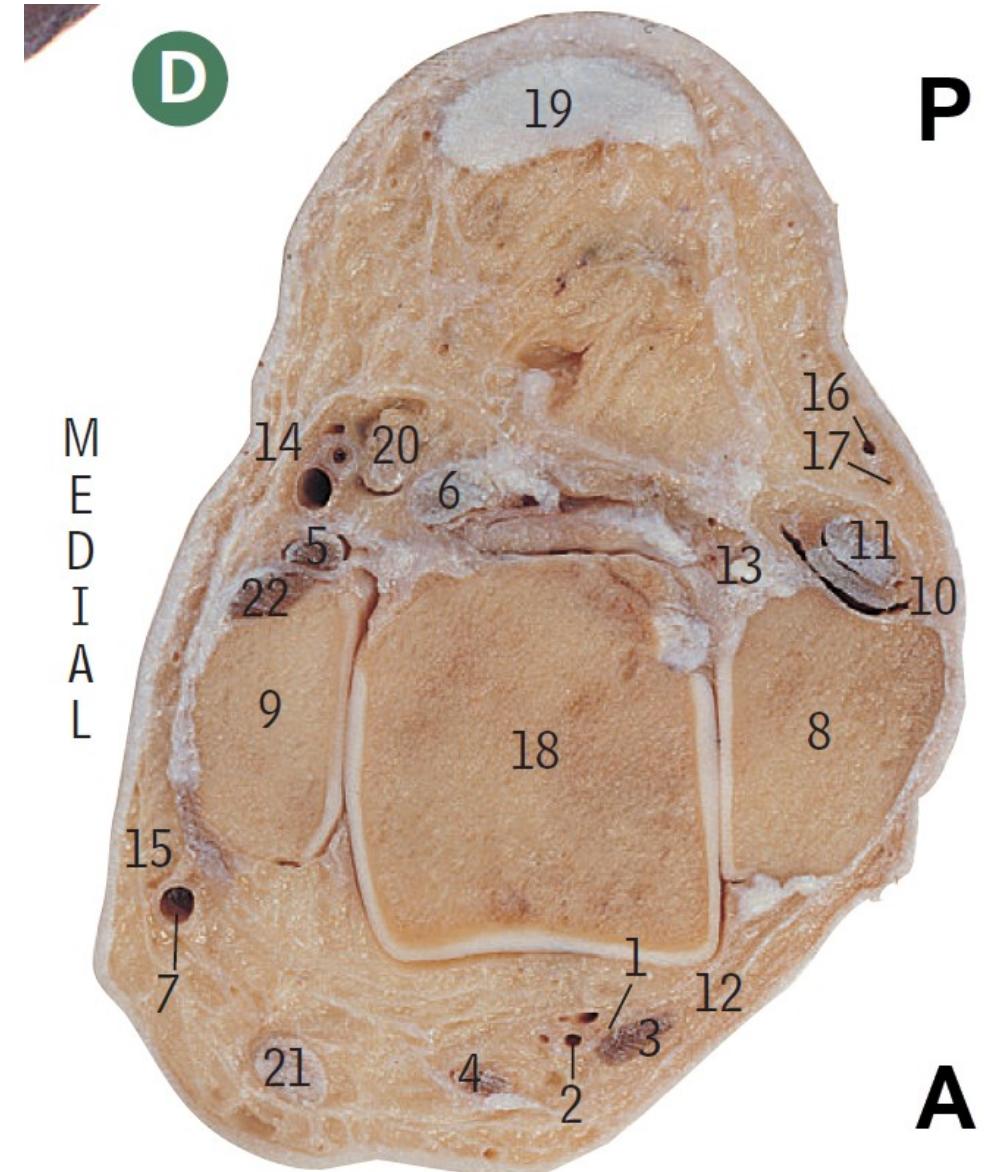
- A. Great saphenous
- B. Short saphenous
- C. Peroneal
- D. Anterior tibial
- E. Popliteal

# Lecture Quiz



- ***Identify the great and small saphenous veins from the attached photo***

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# *Suggested Readings*



- 1. Gray's Anatomy for Students-4th Edition**
- 2. Atlas of human anatomy by Frank H. Netter, 6th Ed**

- For further inquiries  
PLZ feel free to contact at any time through email
- [gamaltaha@med.asu.edu.eg](mailto:gamaltaha@med.asu.edu.eg)



# Thank you